



Airports



Correctional



Education



Arenas



Government



Hospitals



Hotels

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#### **Government Facilities:**

- The White House
- Camp David
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- United States Army Bases (Worldwide)
- United States Marine Corps Bases (Worldwide)
- U.S. Department of State (Washington, DC)

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- Venetian Resort Hotel (Macao, Hong Kong)
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- Goldman Sachs - Investment Banking (Tokyo)

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- Scottrade Center - NHL Arena (St. Louis, MO)
- Oriole Park - MLB Stadium (Baltimore, MD)
- NFL Headquarters of Ravens (Baltimore, MD)
- Tampa Bay Times Forum - RNC 2012 (Tampa, FL)
- Carnegie Hall - Concert Venue (New York, NY)
- Monmouth Park Racetrack - Thoroughbred (Oceanport, NJ)
- CenturyLink Field - NFL Stadium of Seahawks (Seattle, WA)

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- Denver International Airport (Denver, CO)
- Dulles International Airport (Washington, DC)
- Baltimore/Washington International Airport

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- Walt Disney Pictures
- CNN Headquarters
- Lifetime Network
- Time Warner
- Comcast Cable Systems
- CBS TV Studios
- NBC TV Studios
- FOX News Studios

#### **Educational Facilities:**

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- Northeastern University (Boston, MA)
- Drew University (Madison, NJ)
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#### **Specialty Facilities & Markets:**

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• <b>DAP PLUS</b>	<b>Processor:</b> 1x8VSB/QAM inputs; 1xAnalog RF/2xASI outputs	
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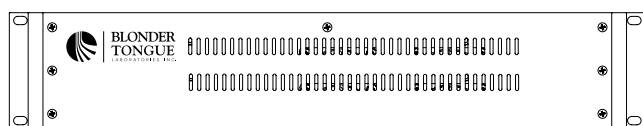
# Multi-screen Streaming

**STEP** is capable of performing high-quality HD/SD MPEG-2 or H.264 encoding, HD/SD MPEG-2 to H.264 and H.264 to MPEG-2 transcoding, HD to SD downscaling, as well as creating Adaptive Bit-Rate live profiles supporting HTTP streaming protocols HLS, HDS and IIS for any-screen video delivery.

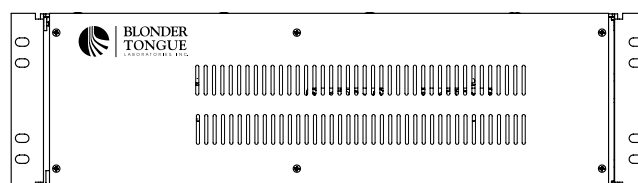
The STEP is a 1RU, 2RU, or 3RU integrated system to perform video processing in a scalable manner to meet the latest video requirements and migrate to next generation video network architecture. The STEP can support multiple video quality encoding bit-rates, multiple audio formats, and text scrolling. STEP is compatible with any industry media server, digital rights managed software, and can be easily integrated into CDN providers to deliver a solution based on customer needs.



Appearance may vary depending upon available hardware. **STEP-1**



Appearance may vary depending upon available hardware. **STEP-2**



Appearance may vary depending upon available hardware. **STEP-3**

## Key Features

- SD/HD MPEG-2/MPEG-4 (H.264) to SD/HD MPEG-2/MPEG-4 (H.264) transcoding
- Adaptive stream (HLS/HDS/IIS) encoding and segmentation
- Motion compensated high-quality format conversion
- HD to SD conversion
- Multi-channel audio support
- Text scrolling support
- CALM/ALC support
- DVB subtitling support

## Optional Features

- Analog inputs support
- Delay inserter
- 8VSB and clear QAM input
- PIP support
- Pro MPEG FEC COP3

## Extras & I/O Options via PCIe Cards

- CALM - per channel stereo
- CALM - per channel 5.1
- Text scrolling feature per channel (SD and HD)
- HDMI input (in the clear) per port
- SD/HD-SDI input/output per port
- ASI input/output per port
- 8VSB/QAM input per channel
- CVBS input per channel



## Ordering Information

Model	Stock #	Platform	Power Supply	Nodes	CPU	PCIe Slots		Encoding/Transcoding MPEG-2/AVC		
						Full	Low	Through-put		
								SD-to-SD	HD-to-SD	HD-to-HD
STEP-1-S	6531 S	1RU	Single	X	1	2	X	16	10	4
STEP-1-D	6531 D	1RU	Dual	X	1	2	X	16	10	4
STEP-2-S1N	6532 S1N	2RU, Single Node	Single	1	2	4	2	10	8	3
STEP-2-D2N	6532 D2N	2RU, 2 Node	Dual	2	4	4	0	30	16	6
STEP-2-D4N	6532 D4N	2RU, 4 Node	Dual	4	8	0	4	60	32	12
STEP-3-D12	6533 D12	3RU, 12 Node, 12 CPU	Dual	12	12	X	X	192	128	48
STEP-3-D24	6533 D24	3RU, 12 Node, 24 CPU	Dual	12	24	X	X	384	256	96

## Compression Standards

<b>Video</b>	<b>MPEG-2:</b> Simple, Main, and 422P Profile up to High Level <b>MPEG-4 AVC/H.264:</b> Baseline, Main, and High Profile up to Level 4.2 HD
<b>Audio</b>	Multiple programs per channel MPEG-1 layer 2 MPEG-2 layer 3 (mp3) MPEG-2/MPEG-4, AAC-LC, AAC-HE Dolby® Digital E, AC-3 pass through Sampling Freq 32, 44.1, 48 kHz

<b>Transcoding:</b>	Full decode/full re-encode mode Scene Change Detection and I frame insertion Fixed and Dynamic GOP Structures
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<b>Rate Control:</b>	CBR VBR Capped VBR Single and Multi-pass modes
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## Resolutions & Frame Rates

<b>Flexible:</b>	Mobile to HD 1080p60 (mix & match resolutions)
<b>Example Common Resolutions</b>	576i and 480i x 720, 544 and 352 pixels @ 25, 29.97 and 30 Hz  1080i x 1920, 1440, 1280 and 960 pixels @ 25, 29.97 and 30 Hz  720p x 1280, 960 and 640 pixels @ 23.976, 50, 59.94 and 60 Hz  1080p x 1920, 1440, 1280, and 960 pixels @ 23.976, 50, 59.94, and 60 Hz (1080p60 is feature upgrade option)

## Processing

<b>Audio/Video/Transport:</b>	Cropping/Scaling (manual or AFD) Single in – multi-out (option)(e.g. PIP) Noise Filtering (option) 0 to 24 hour delay inserter (option) COPv3 FEC Decode/Encode (option) Audio Level Control
<b>Format Conversion:</b>	PAL/NTSC to NTSC/PAL 50i/25p to/from 60i/30p 50p to/from 60p

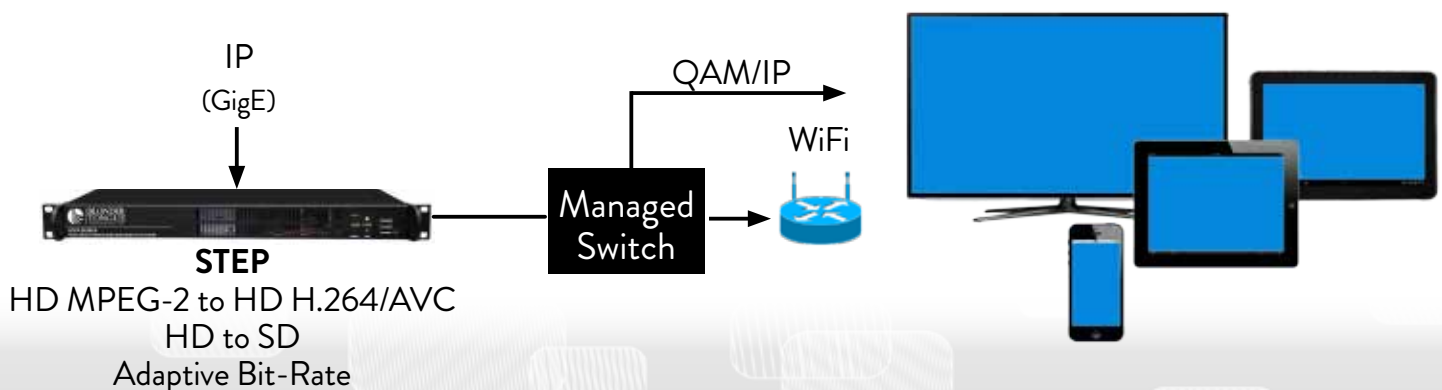
## Input/Output

<b>Bit Stream Formats:</b>	IP/UDP/MPEG2-TS IP/UDP/RTP IP/UDP/RTP/MPEG-TS MPEG-TS (ASI) VSB and Clear QAM inputs (optional PCIe cards) – 2 channels/slot
<b>Interfaces:</b>	IP ASI (option) Analog input (option)
<b>Configuration &amp; Management:</b>	Embedded web-server interface SNMP Control

# TRANSCODING & LIVE STREAMING

STEP SERIES.....MULTI-SCREEN

## Scalable Transcoder-Encoder Platform



Model: **HDE-4S-PRO**

STANDARD HDE-4S-QAM ON PAGE 5

**-NEW-**

**Low Latency Options**

# Digital Video Delivery *Accelerated*

**4xHD-SDI + 1xSpare**



4 Inputs Total



MPEG-2 HD Encoding

DOLBY® Digital Audio Encoding



4 Programs

**4xQAM + 4xIP + 4xASI**

Adjacent (1xRF)

(1xGigE)

## Features

- Superior motion optimization for Professional Sports applications demanding fast, real-time, live encoding of camera feeds
- Accepts up to four (4) programs: 4xHD-SDI
- Supports HD-SDI input loop thru for monitoring
- Simultaneously delivers the following outputs: 4xQAM (Adjacent), 4xIP (SPTS), and 4xASI
- Multiplexes up to four (4) input programs in any of the following output combinations:
  - (i) 1:1 (1 program per QAM channel)
  - (ii) 2:1 (2 programs per QAM channel, not exceeding 38.8 Mbps)
- Each of the four QAM channels can contain 1 or 2 programs, and be turned on/off individually
- Provides 40 dBmV QAM output level for four (4) combined channels
- Provides comprehensive GUI-based monitoring and control via standard Web browsers
- Supports Closed Captioning EIA-608 and EIA-708
- Equipped with EAS interface (Analog Video + L/R Audio)
- Supports Real-time Dolby® Digital audio encoding
- Supports user-defined PSIP configuration

## Ordering Information

Model	Stock #	Description
HDE-4S-PRO	6372	4xHD-SDI + 1xSpare inputs; 4xQAM + 4xIP + 4xASI with EAS
	6372 LL	HDE-4S-PRO with Low Latency option
	6372 48	HDE-4S-PRO with -48 VDC option
	6372 48 LL	HDE-4S-PRO with -48 VDC and Low Latency option
	6372 D	HDE-4S-PRO with Dolby 5.1 option
	6372 D LL	HDE-4S-PRO with Dolby 5.1 and Low Latency option
	6372 48D	HDE-4S-PRO with -48 VDC & Dolby 5.1 options
	6372 48D LL	HDE-4S-PRO with -48 VDC, Low Latency, and Dolby 5.1 options
HDE-4S-LLOPT	6373	Low Latency option (only) for HDE-4S-PRO; S/W license key

**MADE IN U.S.A.**

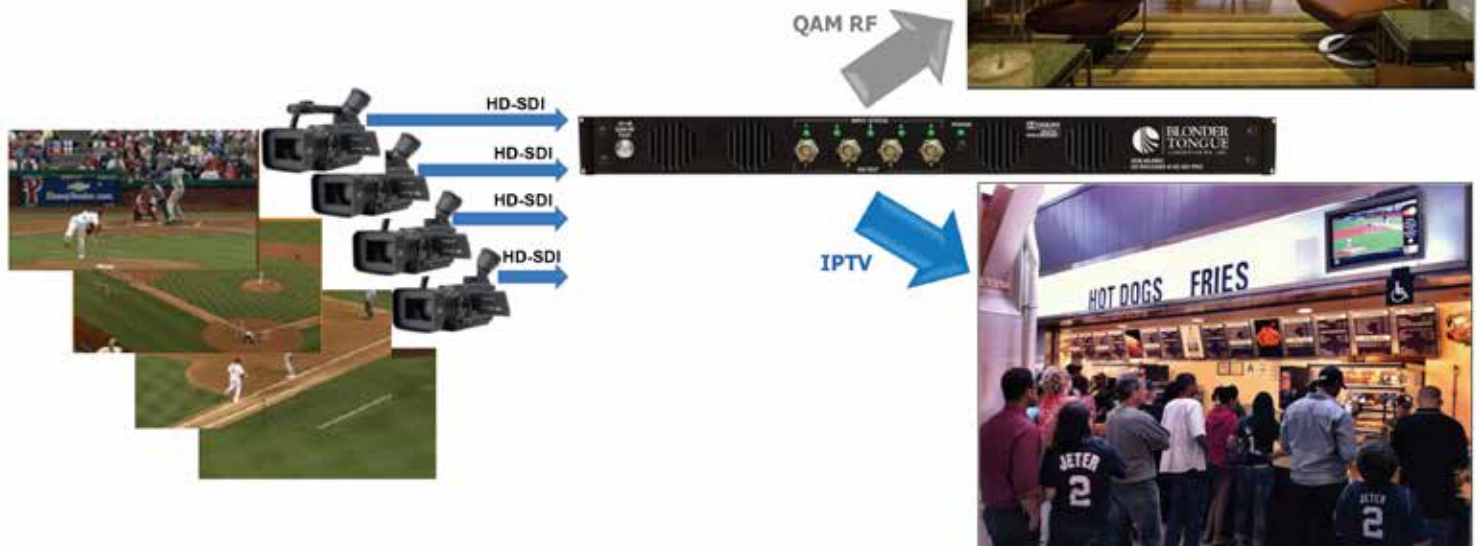






### QAM or IPTV Distribution in Stadiums/Arenas

- Suites
- Concessions



## INPUT

<b>HD-SDI</b>	<b>Connectors:</b>	10x BNC total (4 inputs + 1 Spare in/loop thru)
	<b>Standard:</b>	SMPTE 292M
	<b>Video Resolution:</b>	480i, 720p, & 1080i
	<b>Audio:</b>	Embedded PCM and pass-through Dolby® Digital only
<b>EAS (Emergency Alert System)</b>		
	<b>Connectors:</b>	3x RCA (Video, Audio L & R)
	<b>Trigger Mechanism:</b>	5-12 VDC & Dry Contact Closure (Terminal Strip)
<b>Encoding Profile</b>		
<b>Video</b>	<b>Output Format:</b>	MPEG-2 HD MP@ML; ISO 13818-2
	<b>Chroma:</b>	4:2:0
	<b>Resolution:</b>	480i, 720p, & 1080i
	<b>Frame rate:</b>	29.97 fps (480i); 29.97 fps (1080i); 59.97 fps (720p)
	<b>Aspect Ratio:</b>	4:3 & 16:9
	<b>GOP Structure:</b>	I & P frames (user-selectable)
	<b>Transport Rate:</b>	Variable (user-selectable)
	<b>Video Rate:</b>	Variable (user-selectable)
	<b>Video Pre-filter:</b>	Variable (user-selectable)
	<b>Color Space:</b>	YCbCr and RGB
<b>Audio</b>	<b>Output Format:</b>	Dolby® Digital
	<b>Sampling rate:</b>	48 kHz
	<b>Bit rate:</b>	Variable; 96-448 Kbps (user-selectable)
<b>Closed Captioning</b>		
<b>HD-SDI:</b>		
	EIA-708; Embedded in HD-SDI input	

## OUTPUT

<b>QAM</b>	<b>Connector:</b>	1x "F" Female (rear panel; up to 4x RF QAM ch. combined)
	<b>Modulation:</b>	QAM 16, 32, 64, 128, and 256
	<b>Standards:</b>	ITU-T J.83; Annex A and B
	<b>DVB Symbol Rate:</b>	Variable; up to 7 MSymbol/sec (MBAud)
	<b>Frequency Range:</b>	54 to 1002 MHz
	<b>Tuning:</b>	CATV Channel Selectable (Ch. 2 to 158)
	<b>Channels' Bandwidth:</b>	24 MHz (4x Adjacent 6 MHz)
	<b>RF Level:</b>	40 dBmV (4 ch. combined)
	<b>RF Level Accuracy:</b>	± 1 dB
	<b>Frequency Tolerance:</b>	± 0.5 kHz @ 77 °F (25 °C)
	<b>Frequency Stability:</b>	± 5 kHz over 32 to 122 °F (0 to 50 °C)
	<b>Amplitude Flatness:</b>	± 0.25 dB (over 6 MHz channel)
	<b>Phase Noise:</b>	-98 dBc (@ 10 kHz)
	<b>Spurious:</b>	-57 dBc
	<b>Broadband Noise:</b>	-70 dBc (@ +52 dBmV output level, 5.5 MHz bandwidth)
	<b>Impedance:</b>	75 Ω
	<b>Spectral Inversion:</b>	Auto Recognition
	<b>Carrier Suppression:</b>	45 dB
	<b>Return Loss:</b>	14 dB typical
	<b>Signal-to-Noise Ratio (SNR):</b>	40 dB typical
	<b>MER:</b>	40 dB typical
	<b>I/Q Phase Error:</b>	Less than 1 degree
	<b>I/Q Amplitude Imbalance:</b>	Less than 1%
<b>ASI</b>	<b>Connectors:</b>	4x BNC (Front-panel)
	<b>Format:</b>	DVB-ASI
	<b>Standard:</b>	ETSI EN 50083-9
<b>IP</b>		
	<b>Standard:</b>	Ethernet 1000 Base_T
	<b>Connector:</b>	RJ45
	<b>Network protocols:</b>	UDP, RTP Multicast, Unicast (4 SPTS or combination of SPTS and MPTS outputs)

## General

<b>Dimensions (W x D x H):</b>	19.0 x 18.125 x 1.75 inches (483 x 460 x 44 mm)
<b>Power:</b>	115-230VAC, 60/50Hz (Fuse:3.0A, 250VDC, Slo Blo)
<b>Power Dissipation:</b>	65 W (QAM/IP version)
<b>Weight:</b>	10 lbs (4.54 kg)
<b>Operating Temperature:</b>	32 to 122 °F (0 to 50 °C)
<b>Storage Temperature:</b>	-13 to 158 °F (-25 to 70 °C)
<b>Operating Humidity:</b>	0 to 95% RH @ 35 °C max, non-condensing
<b>Storage Humidity:</b>	0 to 95% RH @ 35 °C max, non-condensing

## Alarms/Monitoring/Control

<b>Local Monitoring:</b>	5x Input Status LEDs 1x Power LED 1x "F" Female RF Test Port 1x IP Reset button
<b>Local Control:</b>	
<b>Remote Monitoring/Control:</b>	GUI-based menu via Web browser (1x RJ45 front-panel connector; 10/100Base-T)



# Ideal for Less Rigorous Motion Content, Such as News or Movies

## 4xHD-SDI + 4xComponent/Composite



MPEG-2 HD Encoding  
DOLBY® Audio Encoding

## 4xQAM + 4xIP + 4xASI

(Adjacent) (1xGigE)

### Features

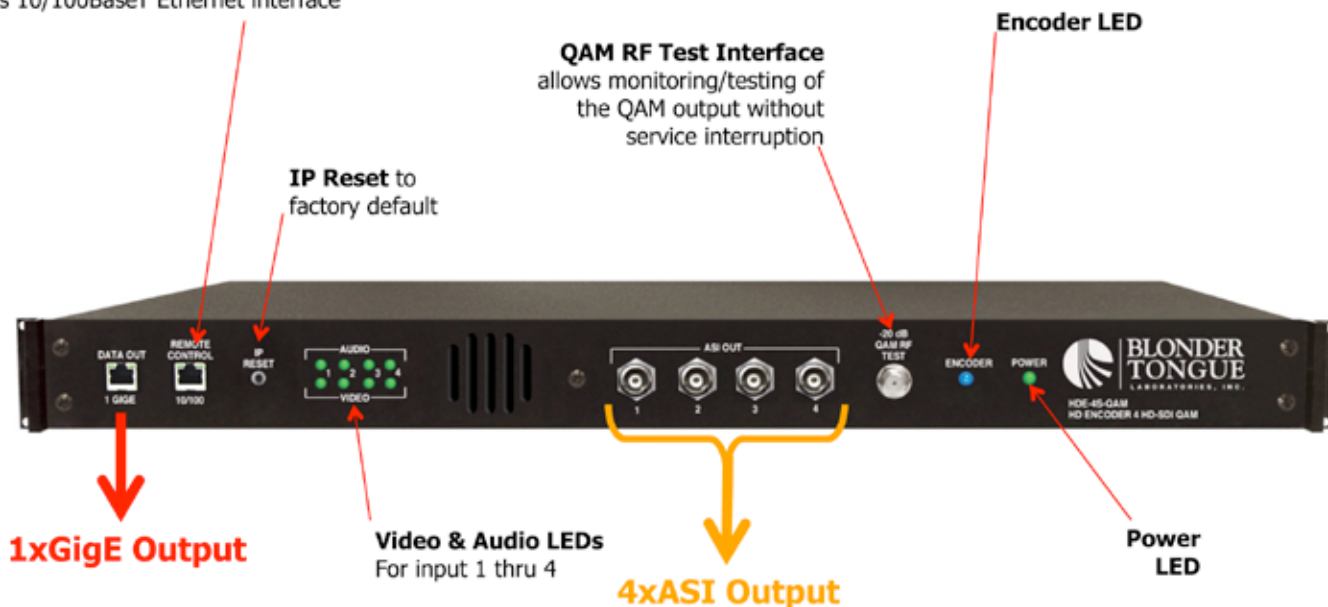
- Accepts up to four programs from any of the following inputs: 4xHD-SDI, and 4xComponent/Composite
- Simultaneously delivers the following outputs: 4xQAM, 4xIP, and 4xASI
- Multiplexes up to four input programs in any of the following output combinations:
  - 1:1 (1 program per QAM channel)
  - 2:1 (2 programs per QAM channel, not exceeding 38.8Mbps)
  - 3:1 (3 programs per QAM channel, not exceeding 38.8 Mbps)
  - 4:1 (4 programs per QAM channel, not exceeding 38.8 Mbps)
- Each of the four QAM channels can contain 1 or 2 programs, and be turned on/off individually
- Provides +52 dBmV QAM output level for four combined channels (+60 dBmV for 1 QAM)
- Provides comprehensive GUI-based monitoring and control via standard Web browsers
- Supports Closed Captioning EIA-608 and EIA-708
- Equipped with EAS interface (Analog Video + L/R Audio)
- Supports Real-time Dolby® Digital audio encoding
- Supports user-defined PSIP configuration



### Ordering Information

Model	Stock #	Description
HDE-4S-QAM	6374A	MPEG-2 HD Encoder; 4xHD-SDI + 4xComponent/Composite inputs; 4xQAM + 4xIP + 4xASI outputs; EAS compatible

**Comprehensive remote monitoring/control** is accomplished using any standard Web browser via this 10/100BaseT Ethernet interface



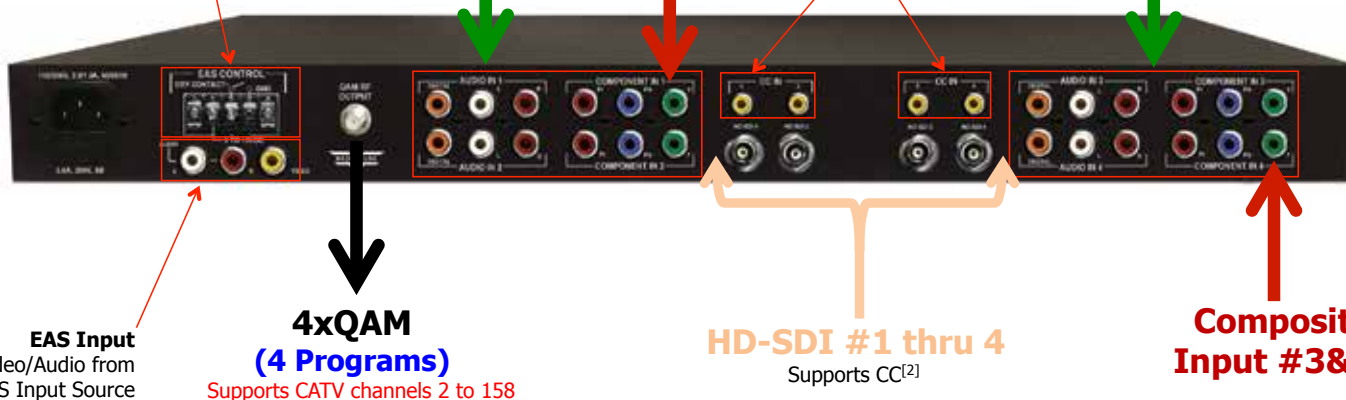
**EAS Control**  
Triggered from the EAS Generator  
Dry Contact & 5-12VDC

**Component #1 & 2**  
Supports Analog & Digital Audio<sup>[1]</sup>

**Composite Input #1&2<sup>[3]</sup>**

**CC Input**  
Closed Captioning input file

**Component #3 & 4**  
Supports Analog & Digital Audio<sup>[1]</sup>

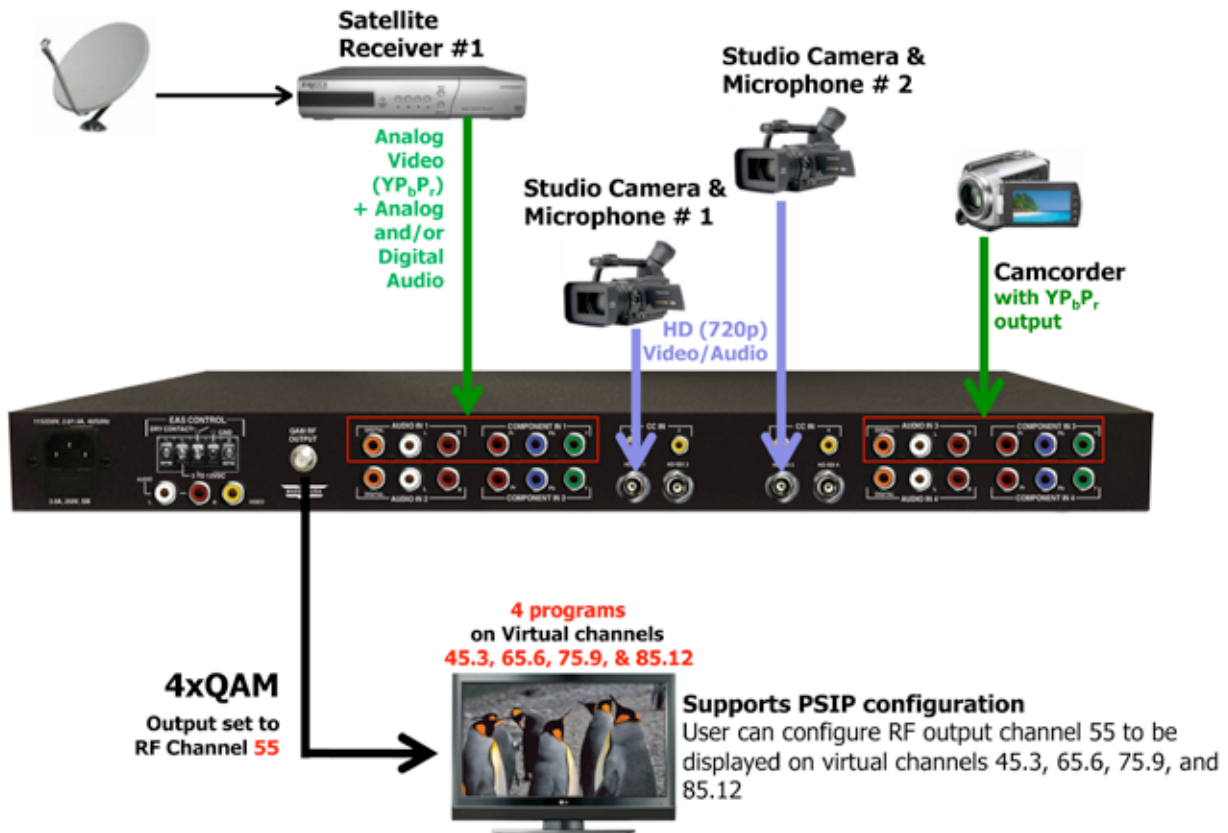


**[1]** The encoder accepts both analog and digital audio inputs. If both inputs are present, the encoder will process the analog as the primary audio source - the digital will become the secondary audio source.

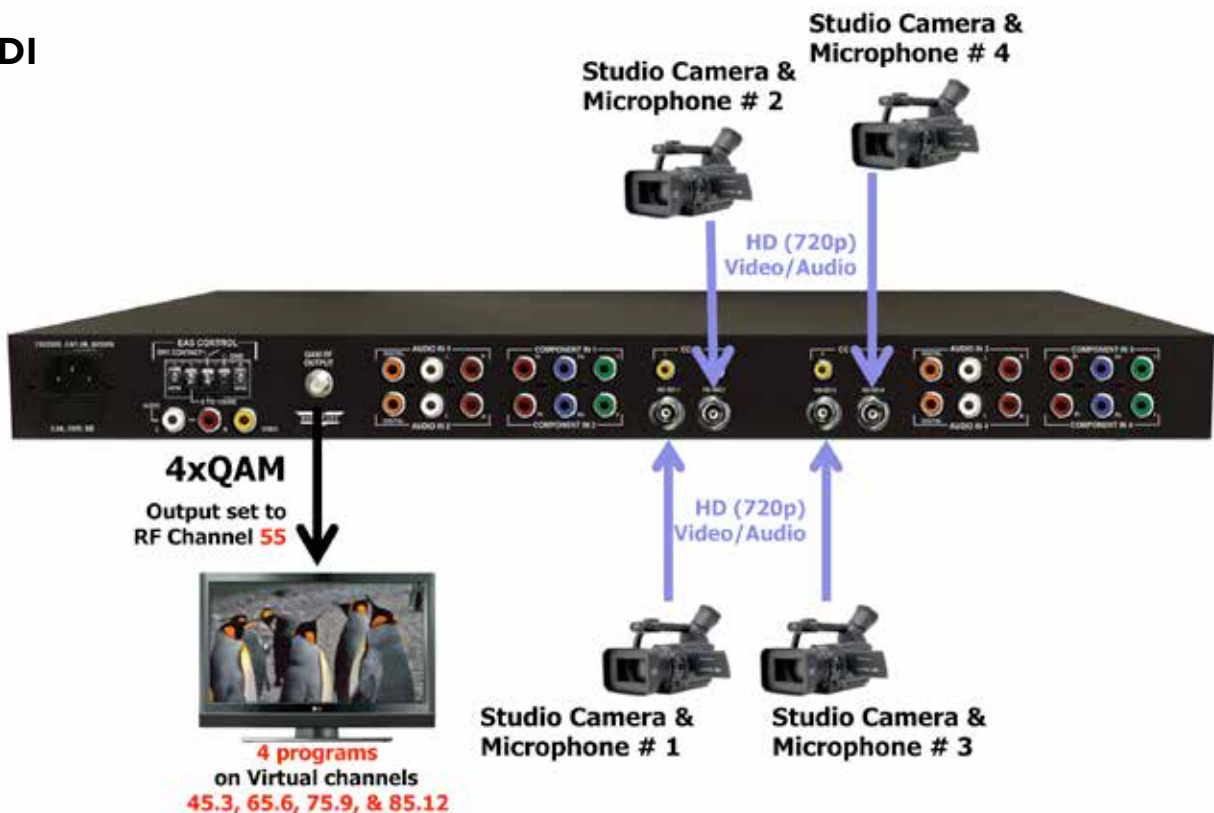
**[2]** The encoder also accepts analog NTSC Closed Captioning (EIA-608, also known as Line 21) from a Composite source, digitizes and then inserts it in the MPEG-2 Transport Stream of the Component input stream. The encoder does support EIA-708 caption protocol if Closed Captioning is embedded in HD-SDI input stream.

**[3]** The Analog L/R audios are shared with Component connectors.

## 2xHD-SDI + 2xComponent



## 4xHD-SDI





## INPUT

<b>HD-SDI</b>	<b>Connectors:</b> 4x BNC <b>Standard:</b> SMPTE 292M <b>Video Resolution:</b> 480i, 720p, & 1080i <b>Audio:</b> Embedded PCM and pass-through Dolby® Digital only
<b>Component</b>	<b>Connectors:</b> 4 sets each 3x RCA for Video (Y, Pb, Pr) <b>Video Resolution:</b> 480i, 720p, & 1080i <b>Video Aspect Ratio:</b> 4:3 & 16:9 <b>Audio:</b> 4 sets each 2x RCA for Analog Audio (L, R) 4 sets each 1x RCA for Digital Audio (PCM)
<b>Composite</b>	<b>Connectors:</b> 4 sets each 1x RCA for Video (Y) <b>Video Resolution:</b> 480i <b>Audio:</b> 4 sets each 2x RCA for Analog Audio (L, R) 4 sets each 1x RCA for Digital Audio (PCM)
<b>EAS (Emergency Alert System)</b>	<b>Connectors:</b> 3x RCA (Video, Audio L & R) <b>Trigger Mechanism:</b> 5-12 VDC & Dry Contact Closure (Terminal Strip)

<b>Encoding Profile</b>	
<b>Video</b>	<b>Output Format:</b> MPEG-2 HD MP@ML; ISO 13818-2 <b>Chroma:</b> 4:2:0 <b>Resolution:</b> 480i, 720p, & 1080i <b>Frame rate:</b> 29.97 fps (480i); 29.97 fps (1080i); 59.97 fps (720p) <b>Aspect Ratio:</b> 4:3 & 16:9 <b>GOP Structure:</b> I & P frames (user-selectable) <b>Transport Rate:</b> Variable (user-selectable) <b>Video Rate:</b> Variable (user-selectable) <b>Video Pre-filter:</b> Variable (user-selectable) <b>Color Space:</b> YCbCr and RGB
<b>Audio</b>	<b>Output Format:</b> Dolby® Digital <b>Sampling rate:</b> 48 kHz <b>Bit rate:</b> Variable; 96-448 Kbps (user-selectable)
<b>Closed Captioning</b>	<b>HD-SDI:</b> EIA-708; Embedded in HD-SDI input <b>Component:</b> EIA-608 <b>Composite:</b> EIA-608

## General

<b>Dimensions (W x D x H):</b>	19.0 x 18.125 x 1.75 inches (483 x 460 x 44 mm)
<b>Power:</b>	115-230VAC, 60/50Hz (Fuse:3.0A, 250VDC, Slo Blo)
<b>Power Dissipation:</b>	60 W
<b>Weight:</b>	8 lbs (3.6 kg)
<b>Operating Temperature:</b>	32 to 122 °F (0 to 50 °C)
<b>Storage Temperature:</b>	-13 to 158 °F (-25 to 70 °C)
<b>Operating Humidity:</b>	0 to 95% RH @ 35 °C max, non-condensing
<b>Storage Humidity:</b>	0 to 95% RH @ 35 °C max, non-condensing

## OUTPUT

<b>QAM</b>	<b>Connector:</b> 1x "F" Female (rear panel; up to 4x RF QAM ch. combined) <b>Modulation:</b> QAM 16, 32, 64, 128, and 256 <b>Standards:</b> ITU-T J.83; Annex A and B <b>DVB Symbol Rate:</b> Variable; up to 7 MSymbol/sec (MBaud) <b>Frequency Range:</b> 54 to 1002 MHz <b>Tuning:</b> CATV Channel Selectable (Ch. 2 to 158) <b>Channels' Bandwidth:</b> 24 MHz (4x Adjacent 6 MHz) <b>RF Level:</b> +42 to +52 dBmV, 1 dB increment (4 ch. combined) +46 to +56 dBmV, 1 dB increment (2 ch. combined) <b>RF Level Accuracy:</b> ± 1 dB <b>Frequency Tolerance:</b> ± 0.5 kHz @ 77 °F (25 °C) <b>Frequency Stability:</b> ± 5 kHz over 32 to 122 °F (0 to 50 °C) <b>Amplitude Flatness:</b> ± 0.25 dB (over 6 MHz channel) <b>Phase Noise:</b> -98 dBc (@ 10 kHz) <b>Spurious:</b> -57 dBc <b>Broadband Noise:</b> -70 dBc (@ +52 dBmV output level, 5.5 MHz bandwidth) <b>Impedance:</b> 75 Ω <b>Spectral Inversion:</b> Auto Recognition <b>Carrier Suppression:</b> 45 dB <b>Return Loss:</b> 14 dB typical <b>Signal-to-Noise Ratio (SNR):</b> 40 dB typical <b>MER:</b> 40 dB typical <b>I/Q Phase Error:</b> Less than 1 degree <b>I/Q Amplitude Imbalance:</b> Less than 1%																		
<b>ASI</b>	<b>Connectors:</b> 4x BNC (Front-panel) <b>Output Assignment:</b> 4 output programs can be assigned as follows: <table><tr><th>No. of SPTS</th><th>No. of MPTS</th><th>Connectors used (user-defined)</th></tr><tr><td>4</td><td>N/A</td><td>1,2,3,4</td></tr><tr><td>3</td><td>N/A</td><td>1,2,3</td></tr><tr><td>2</td><td>1 (2 progs.)</td><td>1,2,3</td></tr><tr><td>0</td><td>2 (2 progs.)</td><td>1,2</td></tr><tr><td>0</td><td>1 (4 progs.)</td><td>1</td></tr></table> <b>Format:</b> DVB-ASI <b>Standard:</b> ETSI EN 50083-9	No. of SPTS	No. of MPTS	Connectors used (user-defined)	4	N/A	1,2,3,4	3	N/A	1,2,3	2	1 (2 progs.)	1,2,3	0	2 (2 progs.)	1,2	0	1 (4 progs.)	1
No. of SPTS	No. of MPTS	Connectors used (user-defined)																	
4	N/A	1,2,3,4																	
3	N/A	1,2,3																	
2	1 (2 progs.)	1,2,3																	
0	2 (2 progs.)	1,2																	
0	1 (4 progs.)	1																	
<b>GigE</b>	<b>Connector:</b> 1x RJ45 (Front-panel) <b>Standard:</b> 1000Base-T Ethernet <b>UDP/RTP:</b> Supported (user-selectable) <b>Address Assignment:</b> 4x IPv4 addresses & port numbers (user-selectable)																		

## Alarms/Monitoring/Control

<b>Local Monitoring:</b>	8x Input Status LEDs (Video 1-4; Audio 1-4) 1x Encoder LED 1x Power LED 1x "F" Female RF Test Port 1x IP Reset button
<b>Local Control:</b>	
<b>Remote Monitoring/Control:</b>	GUI-based menu via Web browser (1x RJ45 front-panel connector; 10/100Base-T)

# Digital Video Delivery Accelerated

**1xHDMI/1xComponent/1xVGA/4xNTSC AV**

SD Only See Page 13



-48VDC Power Option  
(Stock# 6364 PRO 48)

**1xQAM + IP + 1xVGA**  
 (1xGigE) (monitor)  
 (HD 1xSPTS)  
 (SD 1xMPTS + 4xSPTS)

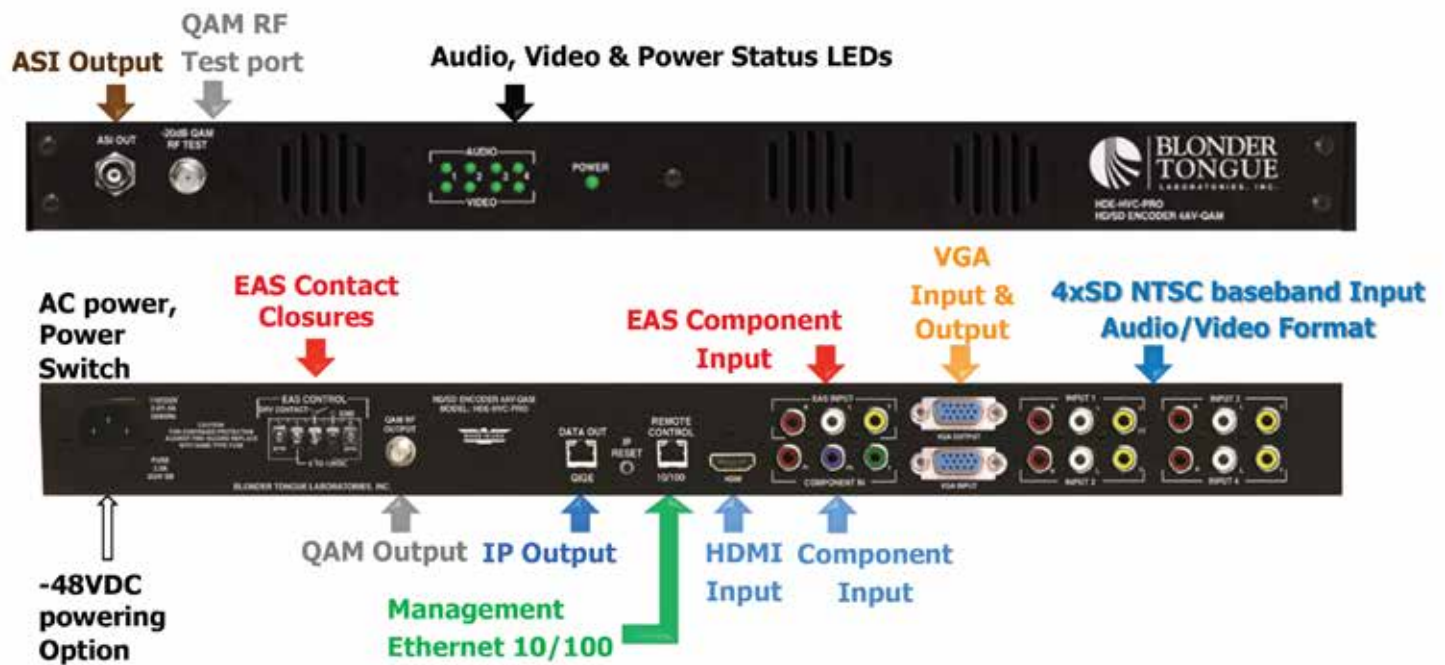
## Features

- Superior motion optimization for Professional Sports applications demanding fast, real-time, live encoding of camera feeds
- **HD Mode:** Accepts one program from any of the following inputs: 1xHDMI (unencrypted), 1xVGA, 1xComponent, and 1xComposite
- **SD Mode:** Accepts up to four programs in NTSC baseband A/V format
- Simultaneously delivers the following outputs: 1xQAM, 1xASI, and IP (GigE)  
(HD 1xSPTS; SD 1xMPTS + 4xSPTS)
- Provides comprehensive GUI-based monitoring and control via standard Web browsers
- Provides a front-panel RF test point (at 20 dB below primary QAM output)
- Configurable to ITU-T J.83 Annex A and B digital QAM formats
- Equipped with EAS interface (Analog Video + L/R Audio)
- Supports Real-time Dolby® Digital audio encoding
- Supports Closed Captioning EIA-608
- Supports user-defined PSIP configuration



## Ordering Information

Model	Stock #	Description
HDE-HVC-PRO	6364 PRO	Professional Series MPEG-2 HD Encoder; 1xHDMI/VGA/Component/Composite inputs; 1xQAM + 1xASI + IP outputs
	6364 PRO 48	Professional Series MPEG-2 HD Encoder; -48 VDC Power



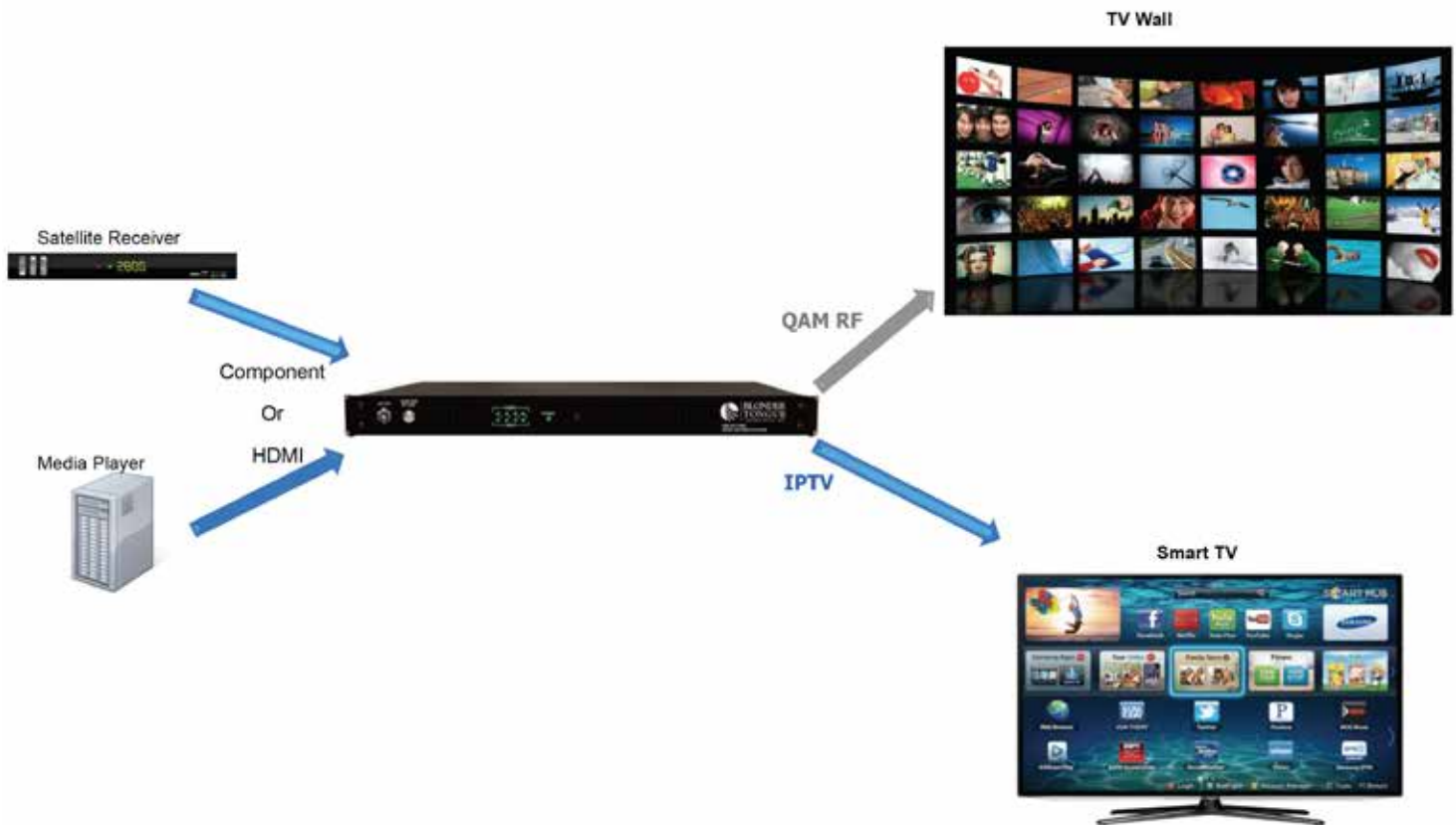


## DELIVERY OF SUPERIOR VIDEO QUALITY

- Sports Venues



- Retail Environment



**INPUT****HD Mode:**

<b>HDMI</b>	<b>Connectors:</b> 1x HDMI <b>Video Resolution:</b> 480i, 720p, & 1080i <b>HDCP Encryption:</b> Not supported <b>Audio:</b> Embedded PCM & pass-through Dolby® Digital only
<b>VGA</b>	<b>Connectors:</b> 2x Female VGA (Input + Loop-through Output) <b>Video Resolution:</b> 640x480 @ 60 fps 800x600 @ 60 fps 1024x768 @ 60 fps <b>Audio:</b> 2x RCA for Analog Audio (L, R)
<b>Component</b>	<b>Connectors:</b> 3x RCA for Video (Y, Pb, Pr) 2x RCA for Analog Audio (L, R) <b>Video Resolution:</b> 480i, 720p, & 1080i <b>Video Aspect Ratio:</b> 4:3 & 16:9

**SD Mode:**

<b>NTSC</b>	<b>Connectors:</b> 4x RCA for Analog Video 4 sets each 2x RCA for Analog Audio (L, R) <b>Video Resolution:</b> 480i
-------------	---

**SD/HD Mode:**

<b>EAS (Emergency Alert System)</b>	
<b>Connectors:</b>	3x RCA (Video, Audio L & R)
<b>Trigger Mechanism:</b>	5-12 VDC & Dry Contact Closure (Terminal Strip)

<b>Video Encoding Profile</b>  <b>Output Format:</b> ISO/IEC 13818-2 MPEG-2 (MP@ML, MP@HL) <b>Chroma:</b> 4:2:0 <b>Aspect Ratio:</b> 4:3; 16x9 (with HD-PRO software upgrade) <b>GOP Structure:</b> I & P frames (user-selectable) <b>Transport Rate:</b> Variable (user-selectable) <b>Video Pre-filter:</b> Variable (user-selectable) <b>Color Space:</b> YCbCr and RGB  <i>Supporting These Formats:</i>					
Mode	Resolution	H x V	Scan	Frames Per Sec.	Recommended Video Bit Rate* (user selectable)
HD	1080i	1920 x 1080	Interlaced	29.97	10-30 Mbps
HD	720p60	1280 x 720	Progressive	59.94	10-30 Mbps
SD	480i	704 x 480	Interlaced	29.97	3-15 Mbps
<i>*The format ( HD or SD ), desired quality level, and most importantly the actual content (talking head, text scroll, full action sports, etc), will determine what bit rate is selected.</i>					
<b>Audio Encoding Profile</b> <b>Output Format:</b> Dolby® Digital <b>Sampling rate:</b> 48 kHz <b>Bit rate:</b> Variable; 128-320 Kbps (user-selectable)					
<b>Closed Captioning</b> <b>NTSC:</b> EIA-608; Embedded in NTSC input					

**OUTPUT**

<b>QAM</b>	<b>Connector:</b> 1x "F" Female (Rear-panel) <b>Modulation:</b> QAM 16, 32, 64, 128, and 256 <b>Standards:</b> ITU-T J.83; Annex A and B <b>DVB Symbol Rate:</b> Variable; up to 7 MSymbol/sec (MBAud) <b>Frequency Range:</b> 54 to 1002 MHz <b>Tuning:</b> CATV Channel Selectable (Ch. 2 to 158) <b>Channels' Bandwidth:</b> 6 MHz <b>RF Level:</b> +40 dBmV <b>RF Level Adjustment:</b> +32 to +42 dBmV, 1 dB increment <b>Frequency Tolerance:</b> ± 0.5 kHz @ 77 °F (25 °C) <b>Frequency Stability:</b> ± 5 kHz over 32 to 122 °F (0 to 50 °C) <b>Amplitude Flatness:</b> ± 0.25 dB (over 6 MHz channel) <b>Phase Noise:</b> -98 dBc @ 10 kHz) <b>Spurious:</b> -60 dBc <b>Broadband Noise:</b> -70 dBc @ +40 dBmV output level, 5.5 MHz bandwidth) <b>Impedance:</b> 75 Ω <b>Spectral Inversion:</b> Auto Recognition <b>Carrier Suppression:</b> 45 dB <b>Return Loss:</b> 14 dB typical <b>Signal-to-Noise Ratio (SNR):</b> 40 dB typical <b>MER:</b> 40 dB typical <b>I/Q Phase Error:</b> Less than 1 degree <b>I/Q Amplitude Imbalance:</b> Less than 1%
<b>ASI</b>	<b>Connectors:</b> 1x BNC (Front-panel) <b>Format:</b> DVB-ASI <b>Standard:</b> ETSI EN 50083-9
<b>GigE</b>	<b>Connector:</b> 1x RJ45 (Rear-panel) <b>Standard:</b> 1000Base-T Ethernet <b>UDP/RTP:</b> Supported (user-selectable)

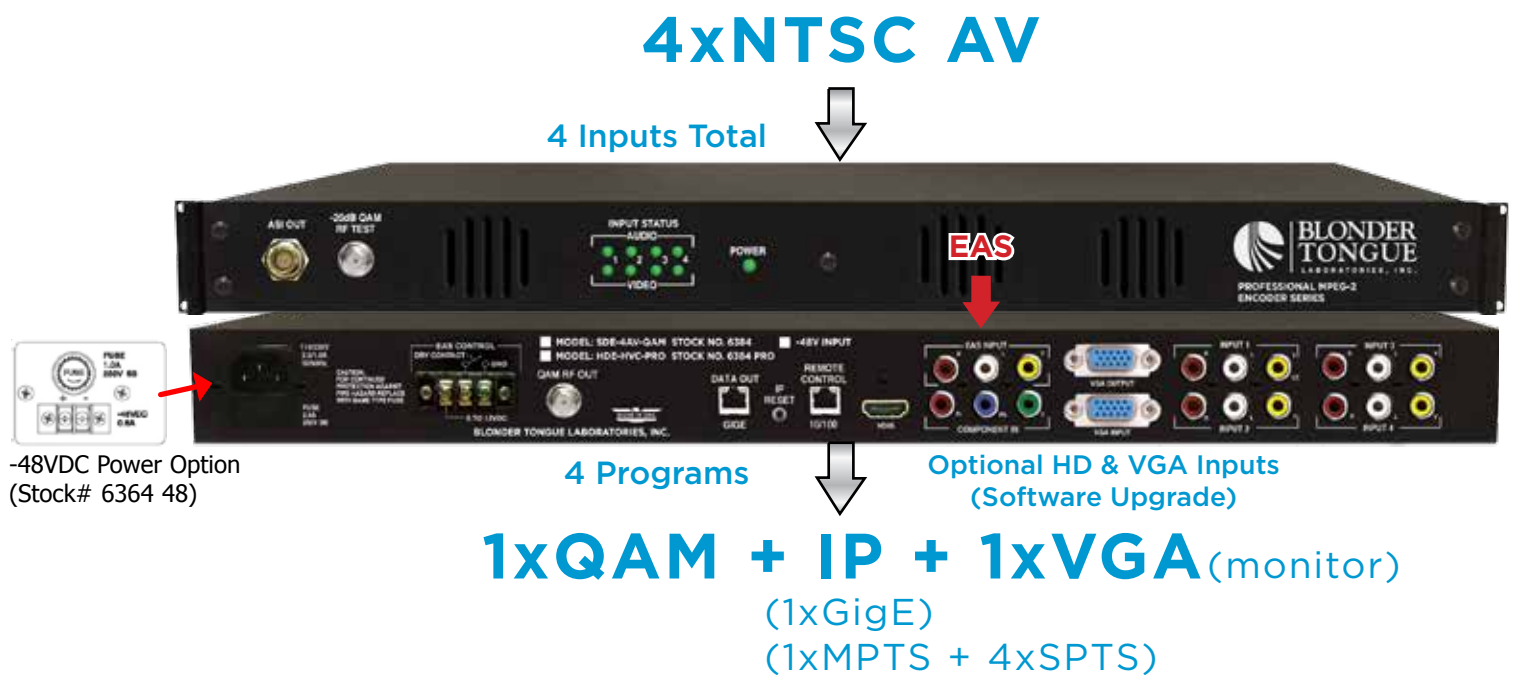
**General**

<b>Dimensions (W x D x H):</b>	19.0 x 18.125 x 1.75 inches (483 x 460 x 44 mm)
<b>Power:</b>	
<b>Stock # 6364 PRO:</b>	110-230VAC, 60/50 Hz (fuse 2.0A, 250V, SloBlo)
<b>Stock # 6364 PRO 48:</b>	-48 VDC (Fuse: 1.0A, 250V, SloBlo)
<b>Power Dissipation:</b>	~40 W (max)
<b>Weight:</b>	~10 lbs (4.5 kg)
<b>Operating Temperature:</b>	32 to 122 °F (0 to 50 °C)
<b>Storage Temperature:</b>	-13 to 158 °F (-25 to 70 °C)
<b>Operating Humidity:</b>	0 to 95% RH @ 35 °C max, non-condensing
<b>Storage Humidity:</b>	0 to 95% RH @ 35 °C max, non-condensing

**Alarms/Monitoring/Control**

<b>Local Monitoring:</b>	8x Input Status LEDs (Video 1-4; Audio 1-4) 1x Power LED 1x "F" Female RF Test Port
<b>Local Control:</b>	1x IP Reset button
<b>Remote Monitoring/Control:</b>	GUI-based menu via Web browser (1x RJ45 rear-panel connector; 10/100Base-T)

# Enhanced SD Performance for Low Bit Rates



## Features

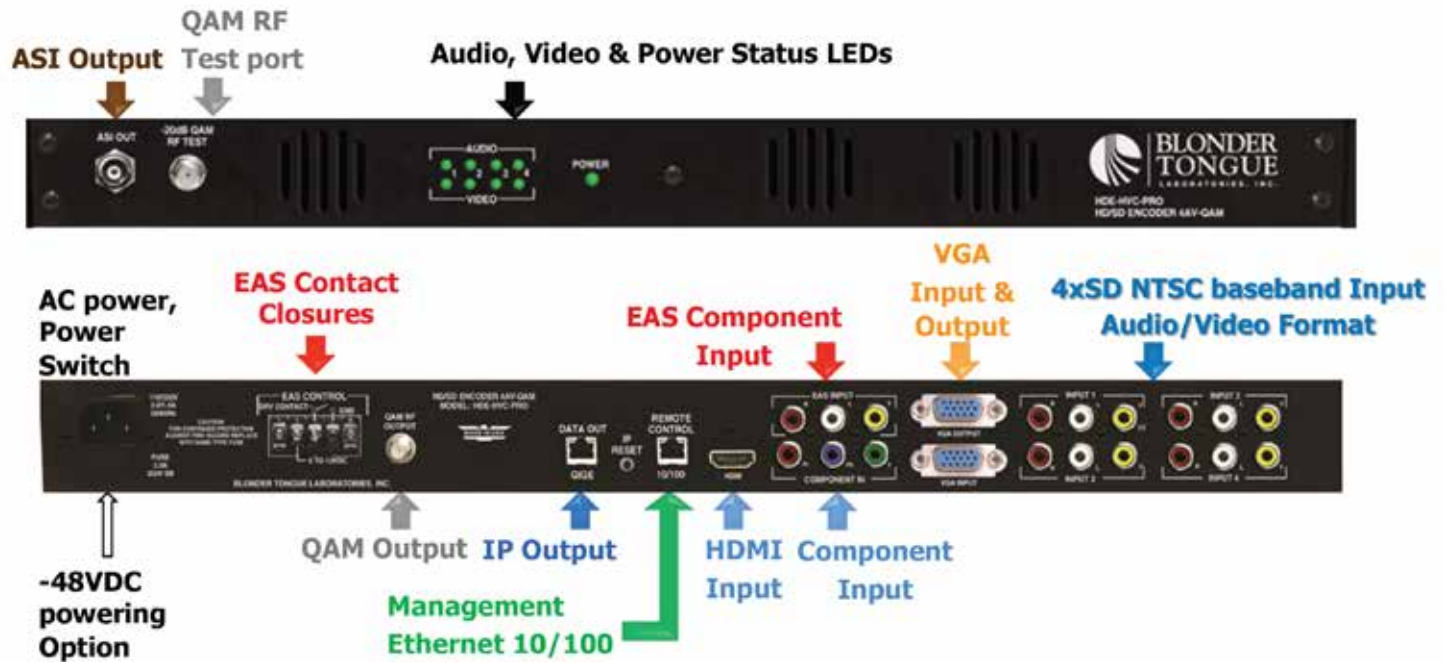
- Accepts up to four programs in NTSC baseband A/V format
- Simultaneously delivers the following outputs: 1xQAM, 1xASI, and IP (GigE; 1xMPTS + 4xSPTS)
- Supports optional HD software upgrade to accept one program from any of the following inputs: 1xHDMI (unencrypted), 1xVGA, or 1xComponent
- Provides comprehensive GUI-based monitoring and control via standard Web browsers
- Provides a front-panel RF test point (at 20 dB below primary QAM output)
- Compatible with ITU Annex A and B digital QAM formats
- Equipped with EAS interface (Analog Video + L/R Audio)
- Supports Real-time Dolby® Digital audio encoding
- Supports Closed Captioning EIA-608
- Supports user-defined PSIP configuration



## Ordering Information

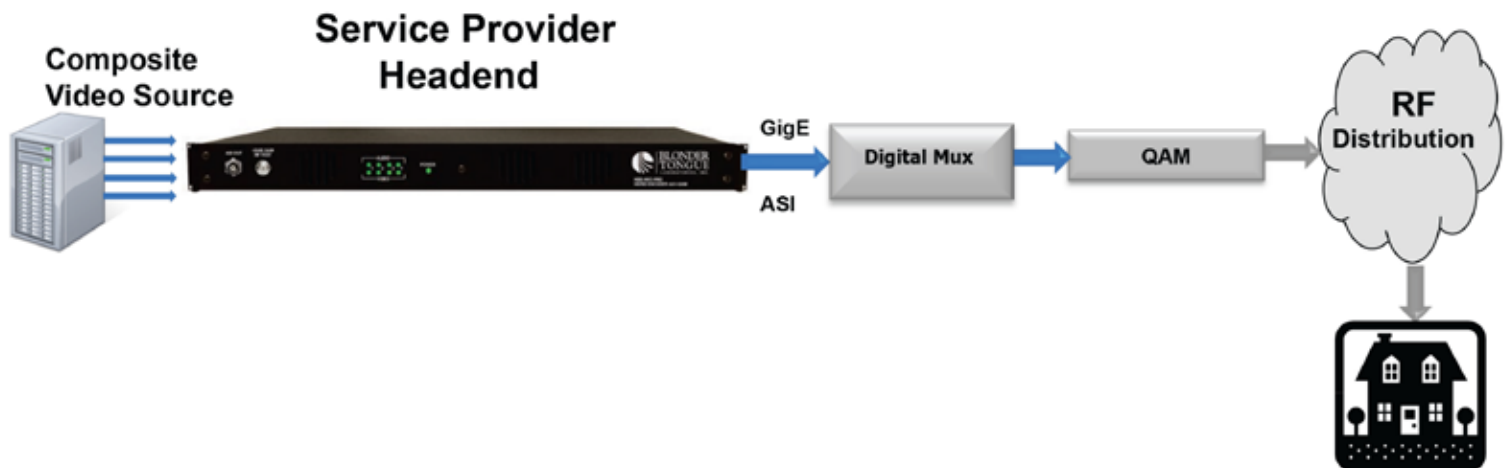
Model	Stock #	Description
SDE-4AV-QAM	6364	MPEG-2 SD Encoder; 4xAV inputs; 1xQAM + 1xASI + IP outputs; EAS compatible
	6364 48	MPEG-2 SD Encoder; -48 VDC Power
SDE-4AV-HD-LIC	6364 LIC	HD-PRO software upgrade for SDE-4AV-QAM. <b>After upgrading, the unit becomes a HDE-HVC-PRO. See page 9.</b>





## MPEG-2 ENHANCED SD ENCODER

- Operators can encode SD programs at low bit rates to increase SD channels per QAM while preserving video quality...



## INPUT

<b>NTSC</b>	<b>Connectors:</b>	4x RCA for Analog Video 4 sets each 2x RCA for Analog Audio (L, R)
	<b>Video Resolution:</b>	480i
<b>EAS (Emergency Alert System)</b>	<b>Connectors:</b>	3x RCA (Video, Audio L & R)
	<b>Trigger Mechanism:</b>	5-12 VDC & Dry Contact Closure (Terminal Strip)
<b>Encoding Profile</b>		
<b>Video</b>	<b>Output Format:</b>	MPEG-2 SD MP@ML; ISO 13818-2
	<b>Chroma:</b>	4:2:0
	<b>Resolution:</b>	480i
	<b>Frame rate:</b>	29.97 fps (480i)
	<b>Aspect Ratio:</b>	4:3
	<b>GOP Structure:</b>	I & P frames (user-selectable)
	<b>Transport Rate:</b>	Variable (user-selectable)
	<b>Video Rate:</b>	Variable (user-selectable)
	<b>Video Pre-filter:</b>	Variable (user-selectable)
	<b>Color Space:</b>	YCbCr and RGB
<b>Audio</b>	<b>Output Format:</b>	Dolby® Digital
	<b>Sampling rate:</b>	48 kHz
	<b>Bit rate:</b>	Variable; 128-320 Kbps (user-selectable)
<b>Closed Captioning</b>		
<b>NTSC:</b>		EIA-608; Embedded in NTSC input

## OPTIONAL INPUT

(Requires HD-PRO Software Upgrade) See Page 9

<b>HDMI</b>	<b>Connectors:</b>	1x HDMI
	<b>Video Resolution:</b>	480i, 720p, & 1080i
	<b>HDCP Encryption:</b>	Not supported
	<b>Audio:</b>	Embedded PCM & pass-through Dolby® Digital only
<b>VGA</b>	<b>Connectors:</b>	2x Female VGA (Input + Loop-through Output)
	<b>Video Resolution:</b>	640x480 @ 60 fps 800x600 @ 60 fps 1024x768 @ 60 fps
	<b>Audio:</b>	2x RCA for Analog Audio (L, R)
	<b>Component</b>	
<b>Component</b>	<b>Connectors:</b>	3x RCA for Video (Y, Pb, Pr) 2x RCA for Analog Audio (L, R)
	<b>Video Resolution:</b>	480i, 720p, & 1080i
	<b>Video Aspect Ratio:</b>	4:3 & 16:9

## OUTPUT

<b>QAM</b>	<b>Connector:</b>	1x "F" Female (Rear-panel)
	<b>Modulation:</b>	QAM 16, 32, 64, 128, and 256
	<b>Standards:</b>	ITU-T J.83; Annex A and B
	<b>DVB Symbol Rate:</b>	Variable; up to 7 MSymbol/sec (MBAud)
	<b>Frequency Range:</b>	54 to 1002 MHz
	<b>Tuning:</b>	CATV Channel Selectable (Ch. 2 to 158)
	<b>Channels' Bandwidth:</b>	6 MHz
	<b>RF Level:</b>	+40 dBmV
	<b>RF Level Adjustment:</b>	+32 to +42 dBmV, 1 dB increment
	<b>Frequency Tolerance:</b>	± 0.5 kHz @ 77 °F (25 °C)
	<b>Frequency Stability:</b>	± 5 kHz over 32 to 122 °F (0 to 50 °C)
	<b>Amplitude Flatness:</b>	± 0.25 dB (over 6 MHz channel)
	<b>Phase Noise:</b>	-98 dBc (@ 10 kHz)
	<b>Spurious:</b>	-60 dBc
	<b>Broadband Noise:</b>	-70 dBc (@ +40 dBmV output level, 5.5 MHz bandwidth)
<b>ASI</b>	<b>Impedance:</b>	75 Ω
	<b>Spectral Inversion:</b>	Auto Recognition
	<b>Carrier Suppression:</b>	45 dB
	<b>Return Loss:</b>	14 dB typical
	<b>Signal-to-Noise Ratio (SNR):</b>	40 dB typical
	<b>MER:</b>	40 dB typical
	<b>I/Q Phase Error:</b>	Less than 1 degree
	<b>I/Q Amplitude Imbalance:</b>	Less than 1%
	<b>Connectors:</b>	1x BNC (Front-panel)
	<b>Format:</b>	DVB-ASI
	<b>Standard:</b>	ETSI EN 50083-9
<b>GigE</b>	<b>Connector:</b>	1x RJ45 (Rear-panel)
	<b>Standard:</b>	1000Base-T Ethernet
	<b>UDP/RTP:</b>	Supported (user-selectable)

## General

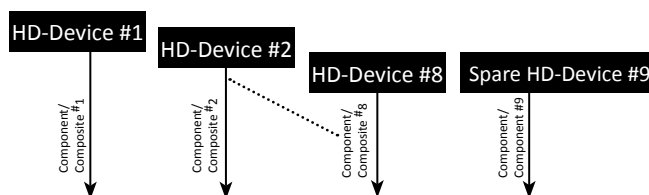
<b>Dimensions (W x D x H):</b>	19.0 x 18.125 x 1.75 inches (483 x 460 x 44 mm)
<b>Power:</b>	<b>Stock # 6364:</b> 110-230VAC, 60/50 Hz (fuse 2.0A, 250V, SloBlo)
	<b>Stock # 6364 48:</b> -48 VDC (Fuse: 1.0A, 250V, SloBlo)
<b>Power Dissipation:</b>	~40 W (max)
<b>Weight:</b>	~10 lbs (4.5 kg)
<b>Operating Temperature:</b>	32 to 122 °F (0 to 50 °C)
<b>Storage Temperature:</b>	-13 to 158 °F (-25 to 70 °C)
<b>Operating Humidity:</b>	0 to 95% RH @ 35 °C max, non-condensing
<b>Storage Humidity:</b>	0 to 95% RH @ 35 °C max, non-condensing

## Alarms/Monitoring/Control

<b>Local Monitoring:</b>	8x Input Status LEDs (Video 1-4; Audio 1-4) 1x Power LED 1x "F" Female RF Test Port
<b>Local Control:</b>	1x IP Reset button
<b>Remote Monitoring/Control:</b>	GUI-based menu via Web browser (1x RJ45 rear-panel connector; 10/100Base-T)

Model: **HDE-8C-QAM**

## Affordable HD



**8xComponent/Composite + 1xSpare**

**8 HD Programs Total**



**MPEG-2 HD Encoding**  
**DOLBY® Audio Encoding**

**8 HD Programs**

**4xQAM**

### Features

- Accepts up to 8 programs from any of the following inputs: 8xComponent and 8xComposite
- Supports additional 1 spare input to replace the failed input
- Digitizes, MPEG-2 encodes, and multiplexes up to 8 inputs into 4 QAM output channels (2 programs per QAM channel)
- Provides any 1 of the 4 QAM output streams in ASI format
- Configurable to ITU-T J.83 Annex A and B digital QAM formats
- Provides comprehensive GUI-based monitoring and control via standard Web browsers
- Provides a front-panel RF test point (at 20 dB below primary QAM output)
- Equipped with EAS interface (Analog Video + L/R Audio) and triggering compatible with all EAS receivers
- Supports Real-time Dolby® Digital audio encoding
- Supports Closed Captioning EIA-608 for each of the 8 encoded programs
- Supports user-defined PSIP configuration



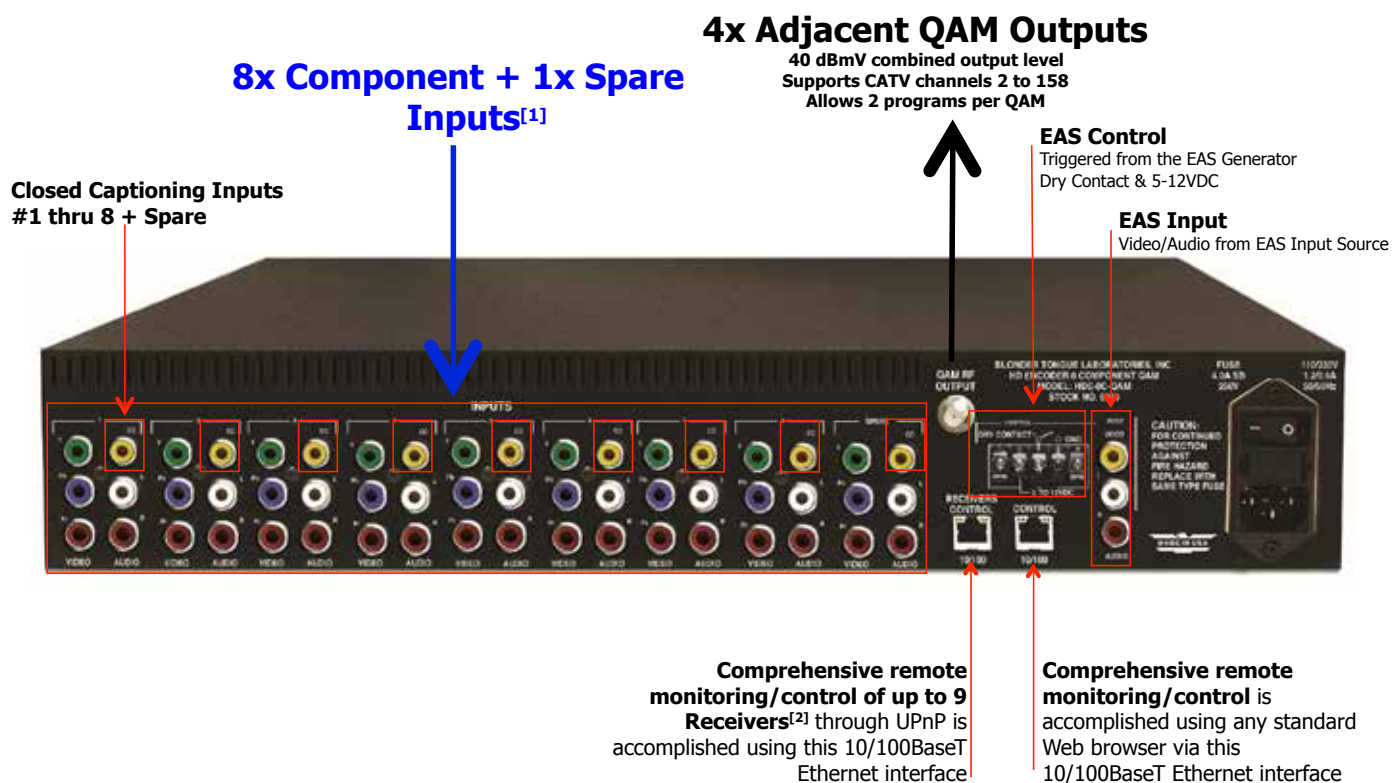
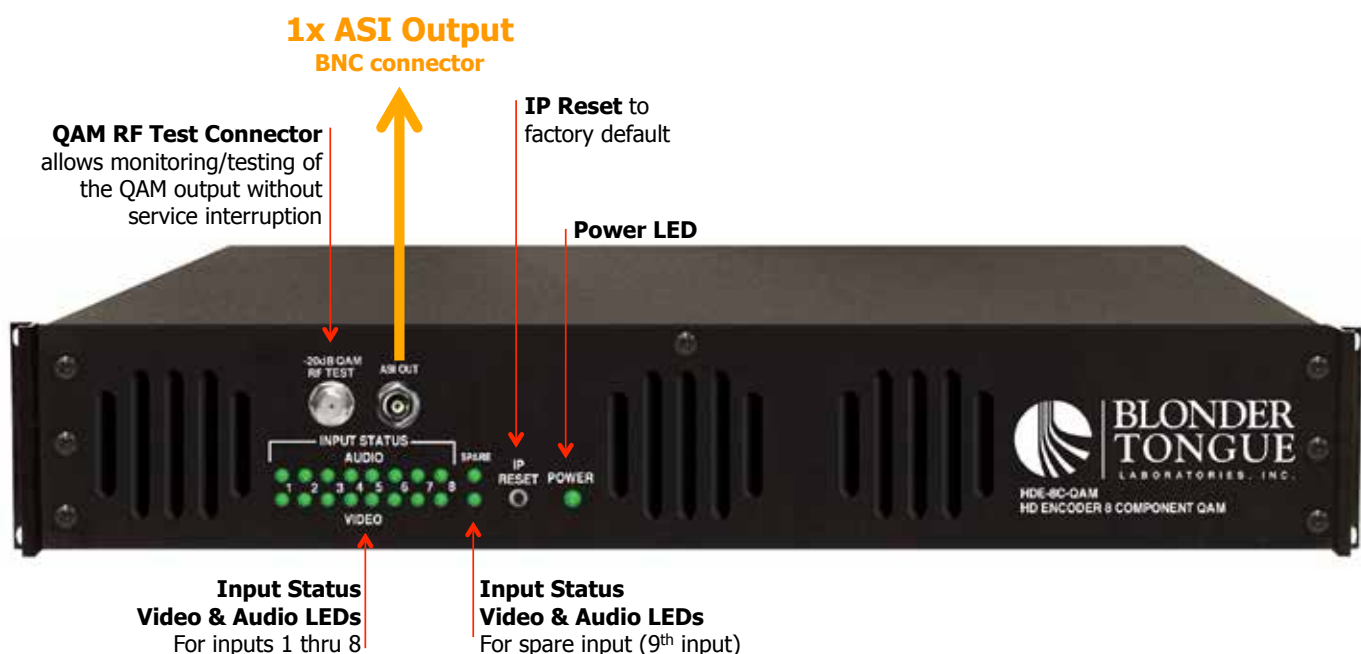
### Ordering Information

Model	Stock #	Description
HDE-8C-QAM	6370	MPEG-2 HD Encoder; 8xComponent + 8xComposite + 1x Spare inputs; 4xQAM + 4xASI outputs, EAS compatible
	<b>6370 1</b>	<b>For Dish Network's ViP211k Satellite Receivers</b>

MADE IN U.S.A.

**CALL FOR MORE INFO**

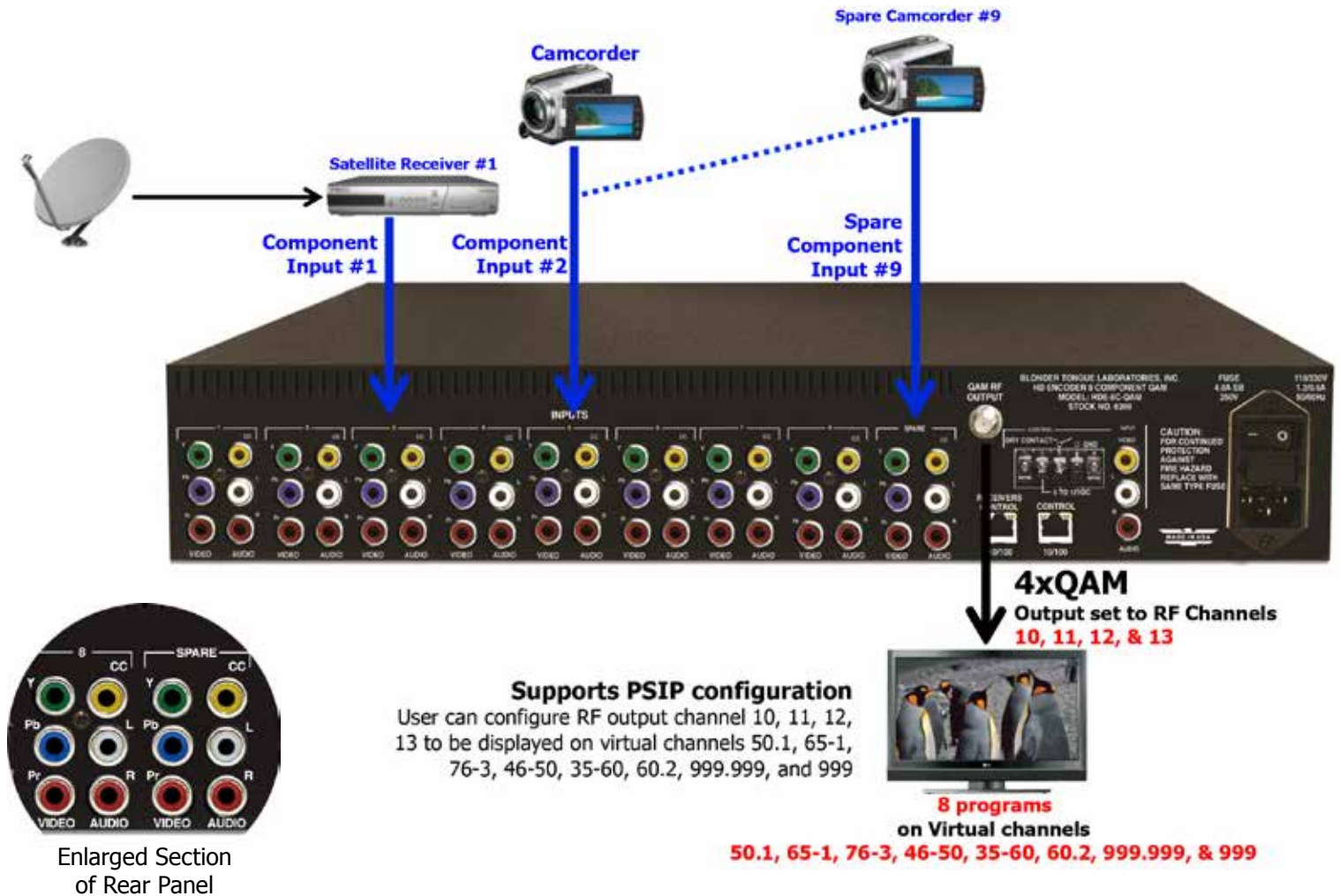




[1] The encoder accepts analog NTSC Closed Captioning (EIA-608, also known as Line 21).

[2] Only functional with DishNetwork's ViP211k satellite receivers, with optional software upgrade (Stock #6371).

## 8xComponent + 1xSpare



## INPUT

<b>Component</b>	
<b>Primary Connectors:</b>	8 sets each 3x RCA for Video (Y, Pb, Pr) 8 sets each 2x RCA for Analog Audio (L, R)
<b>Spare Connectors:</b>	3x RCA for Video (Y, Pb, Pr) 2x RCA for Analog Audio (L, R)
<b>Video Resolution:</b>	480i, 720p, & 1080i
<b>Video Aspect Ratio:</b>	4:3 & 16:9
<b>Composite Video</b>	
<b>Primary Connectors:</b>	8 sets each 1x RCA for Video (Y) 8 sets each 2x RCA for Analog Audio (L,R) (shared with component connectors)
<b>Spare Connectors:</b>	1x RCA for Video (Y) 2x RCA (Video, Audio L & R) (shared with component connectors)
<b>Video Resolution:</b>	480i
<b>EAS (Emergency Alert System)</b>	
<b>Connectors:</b>	3x RCA (Video, Audio L & R)
<b>Trigger Mechanism:</b>	5-12 VDC & Dry Contact Closure (Terminal Strip)

<b>Encoding Profile</b>	
<b>Video</b>	
<b>Output Format:</b>	MPEG-2 HD MP@ML; ISO 13818-2
<b>Chroma:</b>	4:2:0
<b>Resolution:</b>	480i, 720p, & 1080i
<b>Frame rate:</b>	29.97 fps (480i); 29.97 fps (1080i); 59.97 fps (720p)
<b>Aspect Ratio:</b>	4:3 & 16:9
<b>GOP Structure:</b>	I & P frames (user-selectable)
<b>Transport Rate:</b>	Variable (user-selectable)
<b>Video Bit Rate:</b>	Variable (user-selectable)
<b>Video Pre-filter:</b>	Variable (user-selectable)
<b>Audio</b>	
<b>Output Format:</b>	Dolby® Digital
<b>Sampling rate:</b>	48 kHz
<b>Bit rate:</b>	Variable; 128-320 Kbps (user-selectable)
<b>Closed Captioning</b>	
<b>Component:</b>	EIA- 608; 1x RCA (CC)
<b>Composite:</b>	EIA-608

## General

<b>Dimensions (W x D x H):</b>	19.0 x 19.5 x 3.5 inches (483 x 495 x 89 mm)
<b>Power:</b>	110 - 230 VAC, 50/60 Hz (Fuse: 3.0A, 250 VAC, Slo Blo)
<b>Power Dissipation:</b>	~72 W (max)
<b>Weight:</b>	~15 lbs (6.8 kg)
<b>Operating Temperature:</b>	32 to 122 °F (0 to 50 °C)
<b>Storage Temperature:</b>	-13 to 158 °F (-25 to 70 °C)
<b>Operating Humidity:</b>	0 to 95% RH @ 35 °C max, non-condensing
<b>Storage Humidity:</b>	0 to 95% RH @ 35 °C max, non-condensing

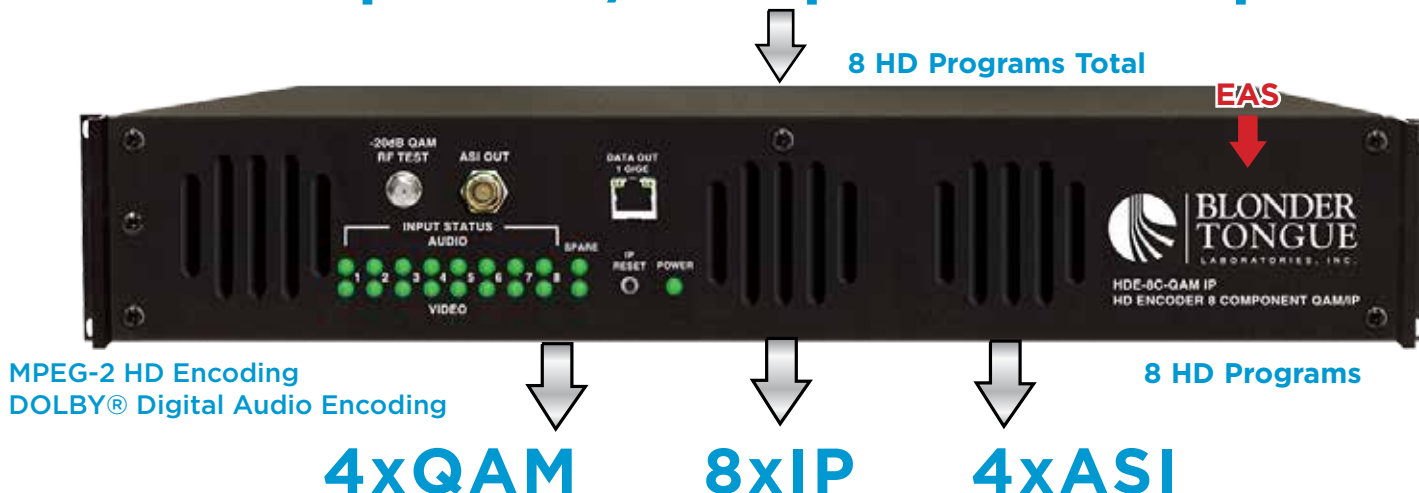
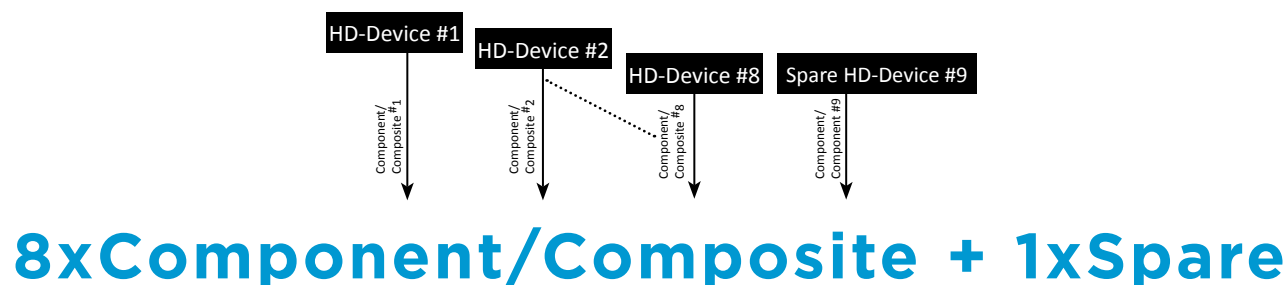
## OUTPUT

<b>QAM</b>	
<b>Connector:</b>	1x "F" Female (rear panel; up to 4x RF QAM ch. combined)
<b>Modulation:</b>	QAM 16, 32, 64, 128, and 256
<b>Standards:</b>	ITU-T J.83; Annex A and B
<b>DVB Symbol Rate:</b>	Variable; up to 7 MSymbol/sec (MBaud)
<b>Frequency Range:</b>	54 to 1002 MHz
<b>Tuning:</b>	CATV Channel Selectable (CH. 2 to 158)
<b>Channel Bandwidth:</b>	24 MHz (4x Adjacent 6 MHz)
<b>RF Level:</b>	+40 dBmV ± 1 dB (4 channels combined)
<b>RF Level Adjustment Range:</b>	+35 to +40 dBmV, 1 dB increment
<b>Frequency Tolerance:</b>	± 0.5 kHz @ 77 °F (25 °C)
<b>Frequency Stability:</b>	± 5 kHz over 32 to 122 °F (0 to 50 °C)
<b>Amplitude Flatness:</b>	± 0.25 dB (over 6 MHz channel)
<b>Phase Noise:</b>	-98 dBc (@ 10 kHz)
<b>Spurious:</b>	-60 dBc
<b>Broadband Noise:</b>	-70 dBc (@ +40 dBmV output level, 5.5 MHz bandwidth)
<b>Impedance:</b>	75 Ω
<b>Spectral Inversion:</b>	Auto Recognition
<b>Carrier Suppression:</b>	45 dB
<b>Return Loss:</b>	14 dB typical
<b>Signal-to-Noise Ratio (SNR):</b>	40 dB typical
<b>MER:</b>	39 dB typical
<b>I/Q Phase Error:</b>	Less than 1 degree
<b>I/Q Amplitude Imbalance:</b>	Less than 1%
<b>ASI</b>	
<b>Connector:</b>	1x BNC (front-panel)
<b>Output Assignment:</b>	Any 1 of 4 QAM output streams
<b>Format:</b>	DVB-ASI
<b>Standard:</b>	ETSI EN 50083-9

## Alarms/Monitoring/Control

<b>Local Monitoring:</b>	16x Input Status LEDs (Video 1-8; Audio 1-8) 2x Spare LEDs (Video & Audio) 1x Power LED
<b>Local Control:</b>	1x "F" Female RF Test Port 1x IP Reset button
<b>Remote Monitoring/Control:</b>	GUI-based menu via Web browser (1x RJ45 connector; 10/100Base-T)

# HD Video Content Over IP Networks



## Features

- Accepts up to 8 programs from any of the following inputs: 8xComponent and 8xComposite
- Supports additional 1 spare input to replace the failed input
- Digitizes, MPEG-2 encodes, and multiplexes up to 8 inputs into 4 QAM output channels (2 programs per QAM channel)
- Provides any 1 of the 4 QAM output streams in ASI format
- Configurable to ITU-T J.83 Annex A and B digital QAM formats
- Provides 8 SPTS IP outputs
- Provides comprehensive GUI-based monitoring and control via standard Web browsers
- Provides a front-panel RF test point (at 20 dB below primary QAM output)
- Equipped with EAS interface (Analog Video + L/R Audio) and triggering compatible with all EAS receivers
- Supports Real-time Dolby® Digital audio encoding
- Supports Closed Captioning EIA-608 for each of the 8 encoded programs
- Supports user-defined PSIP configuration



## Ordering Information

Model	Stock #	Description
HDE-8C-QAM/IP	6370 IP	MPEG-2 HD Encoder; 8xComponent + 8xComposite + 1x Spare inputs; 4xQAM + 8xIP + 4xASI outputs, EAS compatible



## INPUT

<b>Component</b>	
<b>Primary Connectors:</b>	8 sets each 3x RCA for Video (Y, Pb, Pr) 8 sets each 2x RCA for Analog Audio (L, R)
<b>Spare Connectors:</b>	3x RCA for Video (Y, Pb, Pr) 2x RCA for Analog Audio (L, R)
<b>Video Resolution:</b>	480i, 720p, & 1080i
<b>Video Aspect Ratio:</b>	4:3 & 16:9
<b>Composite Video</b>	
<b>Primary Connectors:</b>	8 sets each 1x RCA for Video (Y) 8 sets each 2x RCA for Analog Audio (L,R) (shared with component connectors)
<b>Spare Connectors:</b>	1x RCA for Video (Y) 2x RCA for Analog Audio (L,R) (shared with component connectors)
<b>Video Resolution:</b>	480i
<b>EAS (Emergency Alert System)</b>	
<b>Connectors:</b>	3x RCA (Video, Audio L & R)
<b>Trigger Mechanism:</b>	5-12 VDC & Dry Contact Closure (Terminal Strip)

<b>Encoding Profile</b>	
<b>Video</b>	
<b>Output Format:</b>	MPEG-2 HD MP@ML; ISO 13818-2
<b>Chroma:</b>	4:2:0
<b>Resolution:</b>	480i, 720p, & 1080i
<b>Frame rate:</b>	29.97 fps (480i); 29.97 fps (1080i); 59.97 fps (720p)
<b>Aspect Ratio:</b>	4:3 & 16:9
<b>GOP Structure:</b>	I & P frames (user-selectable)
<b>Transport Rate:</b>	Variable (user-selectable)
<b>Video Bit Rate:</b>	Variable (user-selectable)
<b>Video Pre-filter:</b>	Variable (user-selectable)
<b>Audio</b>	
<b>Output Format:</b>	Dolby® Digital
<b>Sampling rate:</b>	48 kHz
<b>Bit rate:</b>	Variable; 128-320 Kbps (user-selectable)
<b>Closed Captioning</b>	
<b>Component:</b>	EIA- 608; 1x RCA (CC)
<b>Composite:</b>	EIA-608

## General

<b>Dimensions (W x D x H):</b>	19.0 x 19.5 x 3.5 inches (483 x 495 x 89 mm)
<b>Power:</b>	110 - 230 VAC, 50/60 Hz (Fuse: 4.0A, 250 VDC, Slo Blo)
<b>Power Dissipation:</b>	~60 W (max)
<b>Weight:</b>	~15 lbs (6.8 kg)
<b>Operating Temperature:</b>	32 to 122 °F (0 to 50 °C)
<b>Storage Temperature:</b>	-13 to 158 °F (-25 to 70 °C)
<b>Operating Humidity:</b>	0 to 95% RH @ 35 °C max, non-condensing
<b>Storage Humidity:</b>	0 to 95% RH @ 35 °C max, non-condensing

## OUTPUT

<b>QAM</b>	
<b>Connector:</b>	1x "F" Female (rear panel; up to 4x RF QAM ch. combined)
<b>Modulation:</b>	QAM 16, 32, 64, 128, and 256
<b>Standards:</b>	ITU-T J.83; Annex A and B
<b>DVB Symbol Rate:</b>	Variable; up to 7 MSymbol/sec (MBaud)
<b>Frequency Range:</b>	54 to 1002 MHz
<b>Tuning:</b>	CATV Channel Selectable (CH. 2 to 158)
<b>Channel Bandwidth:</b>	24 MHz (4x Adjacent 6 MHz)
<b>RF Level:</b>	+40 dBmV ± 1 dB (4 channels combined)
<b>RF Level Adjustment Range:</b>	+35 to +42 dBmV, 1 dB increments
<b>Frequency Tolerance:</b>	± 0.5 kHz @ 77 °F (25 °C)
<b>Frequency Stability:</b>	± 5 kHz over 32 to 122 °F (0 to 50 °C)
<b>Amplitude Flatness:</b>	± 0.25 dB (over 6 MHz channel)
<b>Phase Noise:</b>	-98 dBc (@ 10 kHz)
<b>Spurious:</b>	-60 dBc
<b>Broadband Noise:</b>	-70 dBc (@ +40 dBmV output level, 5.5 MHz bandwidth)
<b>Impedance:</b>	75 Ω
<b>Spectral Inversion:</b>	Auto Recognition
<b>Carrier Suppression:</b>	45 dB
<b>Return Loss:</b>	14 dB typical
<b>Signal-to-Noise Ratio (SNR):</b>	40 dB typical
<b>MER:</b>	39 dB typical
<b>I/Q Phase Error:</b>	Less than 1 degree
<b>I/Q Amplitude Imbalance:</b>	Less than 1%
<b>ASI</b>	
<b>Connector:</b>	1x BNC (front-panel)
<b>Output Assignment:</b>	Any 1 of 4 QAM output streams
<b>Format:</b>	DVB-ASI
<b>Standard:</b>	ETSI EN 50083-9
<b>GigE</b>	
<b>Connector:</b>	1x RJ45 (front panel)
<b>Standard:</b>	1000BASE-T Ethernet
<b>UDP/RTP:</b>	Supported (user-selectable)
<b>Address Assignment:</b>	8x IPv4 Address and port numbers (user-selectable)

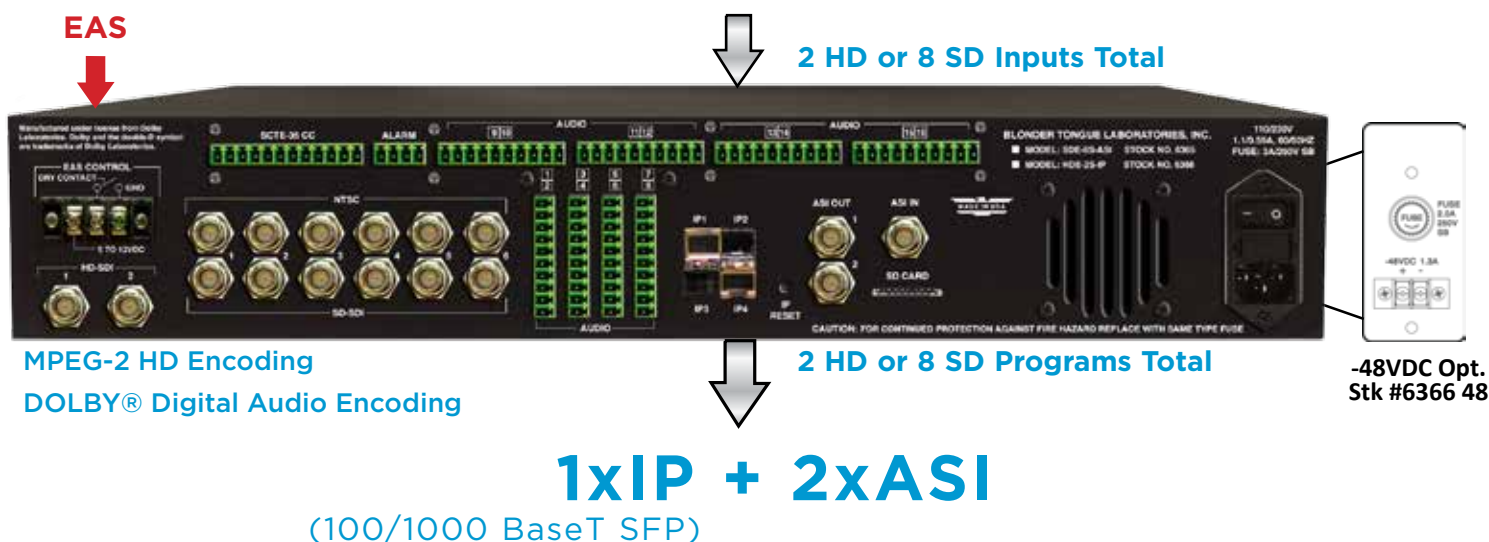
## Alarms/Monitoring/Control

<b>Local Monitoring:</b>	16x Input Status LEDs (Video 1-8; Audio 1-8) 2x Spare LEDs (Video & Audio) 1x Power LED
<b>Local Control:</b>	1x "F" Female RF Test Port 1x IP Reset button
<b>Remote Monitoring/Control:</b>	GUI-based menu via Web browser (1x RJ45 connector; 10/100Base-T)

Model: **HDE-2S-IP**

# Multiple Audio & Ad-Insertion

## 2xHD-SDI or 8xSD-SDI/NTSC



## Features

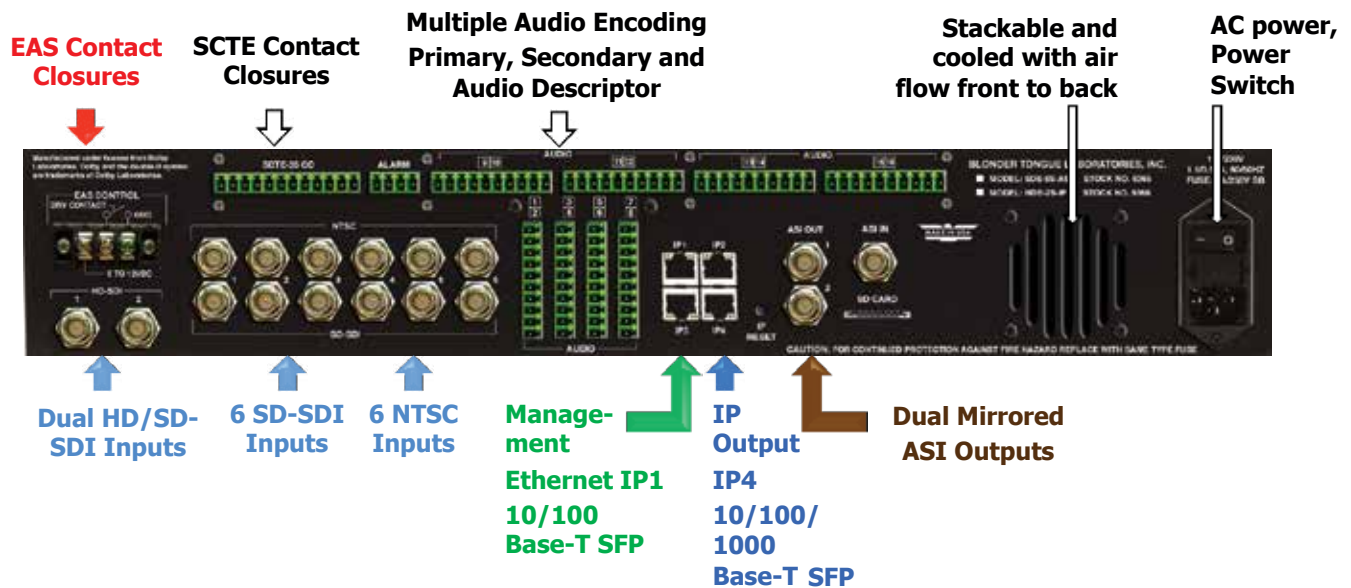
- Accepts up to (2) HD or (8) SD programs from the following inputs: 2xHD-SDI, 6xSD-SDI, and/or 6xNTSC.
- Simultaneously delivers the following outputs: 2xASI (mirrored) and 1xIP (100/1000 BaseT)
- Provides comprehensive GUI-based monitoring and control using standard web browsers via 10/100 BaseT SFP module (included)
- Provides audio encoding for Primary Audio, SAP (Secondary Audio Program), & Audio Descriptor Service
- Provides user-selectable audio level adjustment of +/- 6 dB in 0.5 dB increments on all analog audio inputs through GUI interface
- Detects ad messaging via SCTE 35 activated by either multiple Cue Tone Audio inputs or upon contact closures (user selectable)
- Supports Closed Captioning EIA-608 and EIA-708
- Supports Real-time Dolby® Digital audio encoding
- Supports Emergency Alert System (EAS)
- Supports user-defined static PSIP configuration
- Supports compressed digital audio pass through for all SDI inputs
- Supports fixed VBR and Stat-Mux video encoding



## Ordering Information

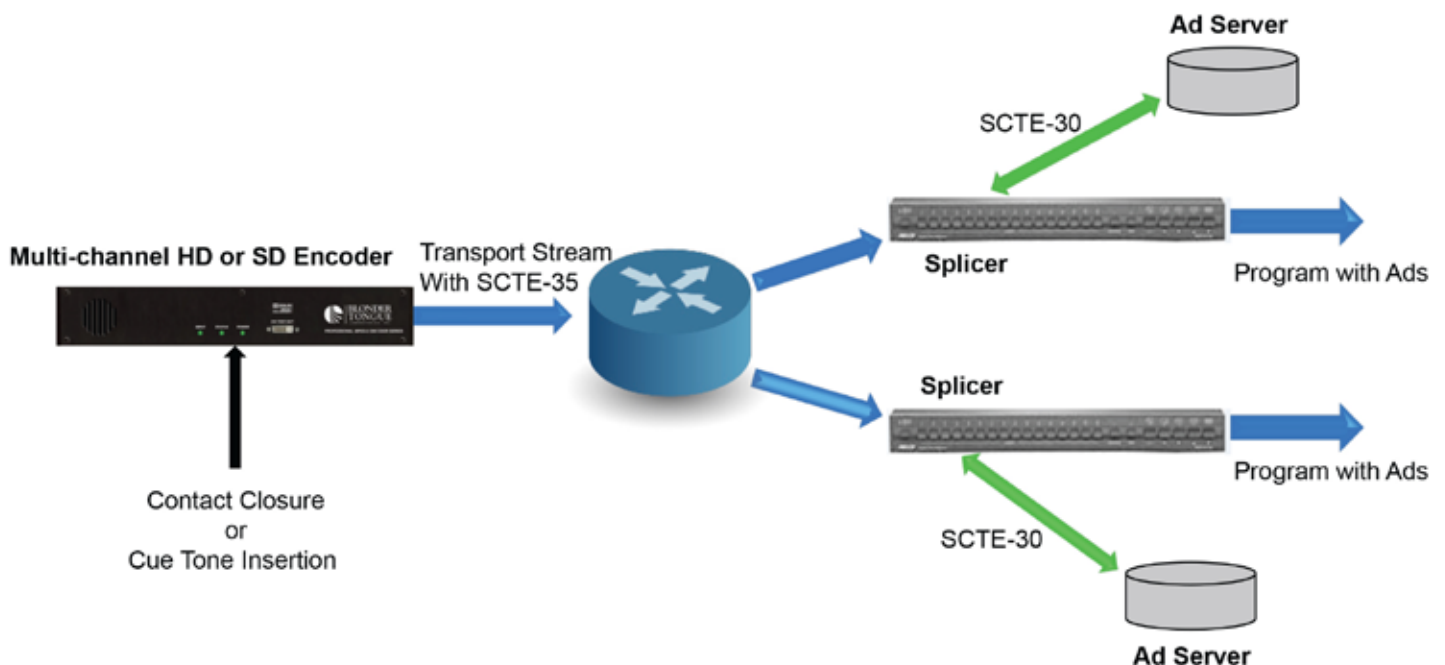
Model	Stock #	Description
HDE-2S-IP	6366	MPEG-2 HD/SD Encoder/Multiplexer (2 HD-SDI or 8 SD-SDI inputs), 110-230VAC
	6366 48	MPEG-2 HD/SD Encoder with -48VDC Power

**MADE IN U.S.A.**

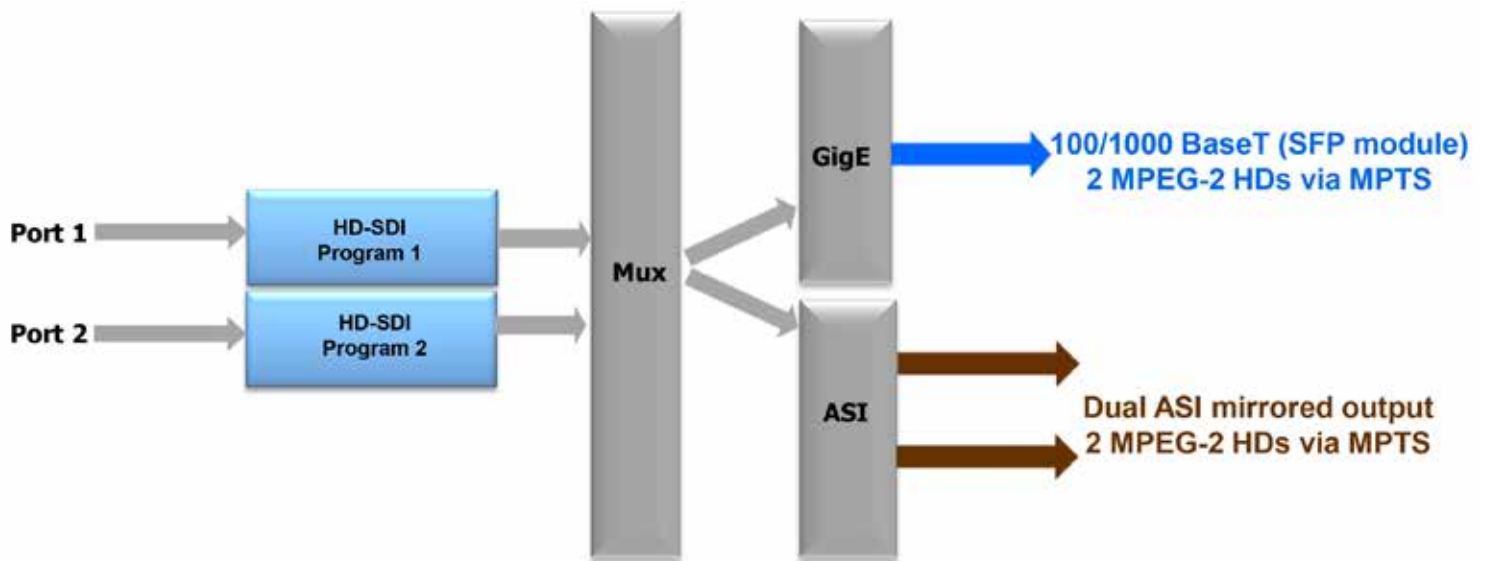


### DIGITAL PROGRAM INSERTION SIGNALING

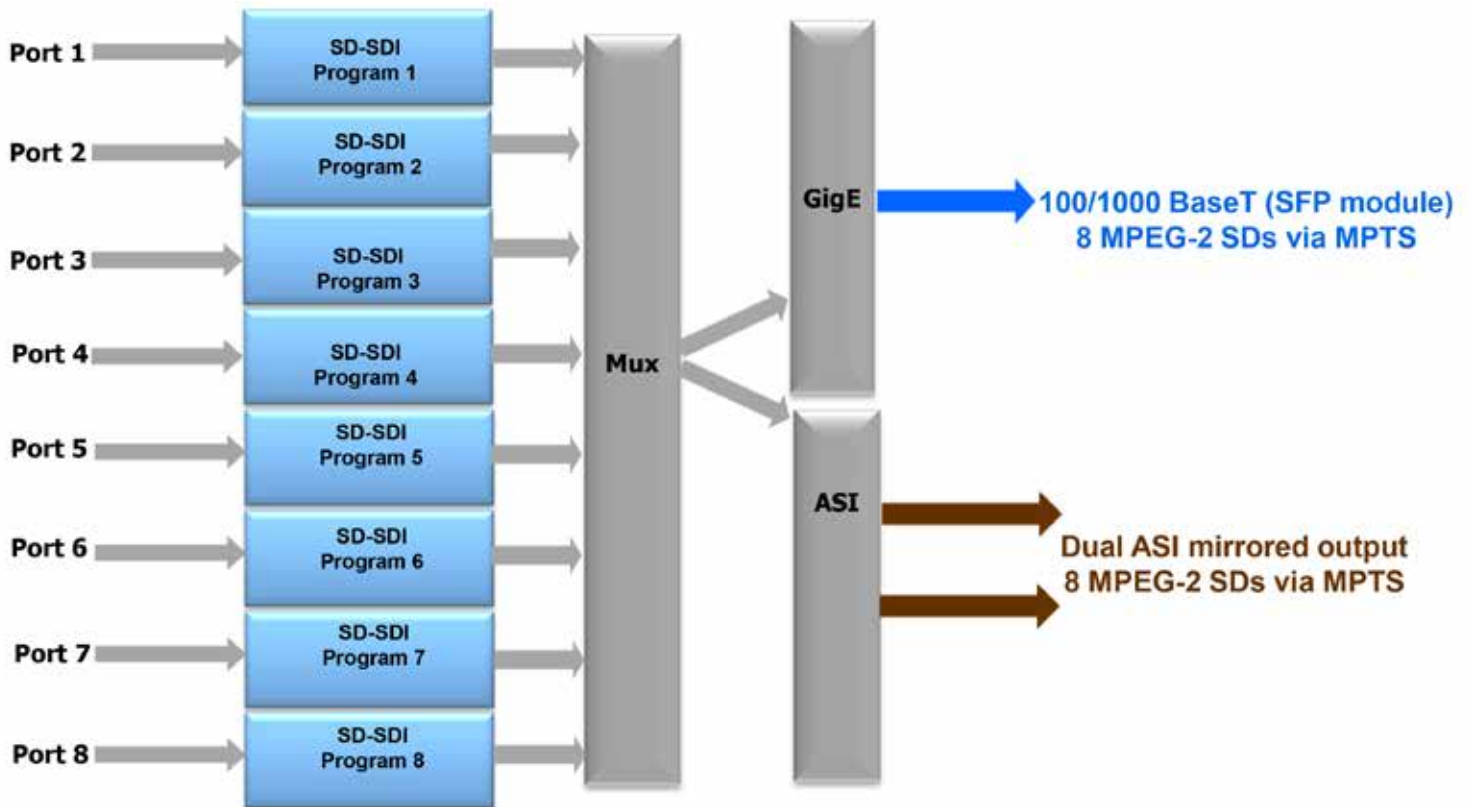
- Digital Program Insertion (DPI) signaling allows the downstream Splicer to insert advertisement(s) into the program stream
- Triggers are sent into the encoder which produce frame accurate DPI messages (SCTE 35) to allow the downstream splicer to insert advertisement



**2 HD-SDI INPUT TO ASI/IP OUTPUT**



**8 SD-SDI INPUT TO ASI/IP OUTPUT**





## INPUT

<b>HD-SDI</b>	<b>Connectors:</b> 2x BNC <b>Standard:</b> SMPTE 292M <b>Video Resolution:</b> 480i, 720p, & 1080i <b>Audio:</b> Embedded PCM and pass-thru Dolby® Digital Analog Stereo Balanced Audio (SD-SDI)
<b>SD-SDI</b>	<b>Connectors:</b> 6x BNC <b>Standard:</b> SMPTE 259M <b>Video Resolution:</b> 480i <b>Audio:</b> Embedded PCM and pass-through Dolby® Digital Analog Stereo Balanced Audio
<b>NTSC</b>	<b>Connectors:</b> 6x BNC for Analog Video 8x terminal strips for Analog Audio <b>Standard:</b> Analog Video <b>Video Resolution:</b> 525 lines per frame <b>Audio:</b> Analog Stereo Balanced Audio
<b>EAS(Emergency Alert System)</b>	<b>Connectors:</b> <b>BNC:</b> Video (User-selectable NTSC 1 to 6) <b>Terminal:</b> Audio (User-selectable Audio 1 to 16) <b>Standard:</b> Analog Audio/Video <b>Trigger Mechanism:</b> 5-12 VDC & Dry Contact Closure (Terminal Strip)

<b>Encoding Profile</b>	
<b>Video</b>	<b>Output Format:</b> MPEG-2 MP@ML, ISO 13818-2 <b>Chroma:</b> 4:2:0 <b>Resolution:</b> 480i, 720p & 1080i <b>Frame rate:</b> 29.97 fps (480i); 29.97 fps (1080i); 59.97 fps (720p) <b>Aspect Ratio:</b> 4:3, 16:9 <b>GOP Structure:</b> I & P frames (user-selectable) <b>Transport Rate:</b> Variable (user-selectable) <b>Video Rate:</b> Variable (user-selectable) <b>Video Pre-filter:</b> Variable (user-selectable) <b>Color Space:</b> YCbCr
<b>Audio</b>	<b>Output Format:</b> Dolby® Digital <b>Sampling rate:</b> 48 kHz <b>Bit rate:</b> Variable; 96-448 Kbps (user-selectable) <b>Level Adjustment:</b> ± 6 dB, 1 dB increment (user-selectable)
<b>Digital Program Insertion (DPI)</b>	<b>Connectors:</b> Terminal strip for Cue Tone Audio <b>Standard:</b> SCTE 35
<b>Closed Captioning</b>	<b>HD/SD -SDI:</b> EIA-608, EIA 708; (Embedded in input) <b>NTSC:</b> EIA-608 (Embedded in input)

## OUTPUT

<b>ASI</b>	<b>Connector:</b> 2x BNC (Rear-panel) <b>Format:</b> DVB-ASI <b>Standard:</b> ETSI EN 50083-9
<b>IP</b>	<b>Connector:</b> 1x SFP (Rear-panel - SFP module included) <b>Standard:</b> IEEE 802.3 100/1000 Base-T Ethernet <b>Network Protocols:</b> UDP, RTP, multicast, unicast, MPTS output

## Baseband Analog Audio Encoding

SD-SDI or NTSC Video Input #	1	2	3	4	5	6
<b>Primary Audio</b>	Y	Y	Y	Y	Y	Y
<b>Secondary Audio</b>	Y	Y	Y	Y	Y	Y
<b>Video Descriptor Audio</b>	Y	Y	Y	Y	Note 1	Note 1
<b>Cue Tone Audio</b>	Note 2	Note 2	Note 2	Note 2	Note 2	Note 2
<b>Cue Tone via Contact Closure</b>	Note 3	Note 3	Note 3	Note 3	Note 3	Note 3

There are a total of sixteen (16) stereo analog audio encoding engines in the unit. The table above illustrates one example of how this resource may be utilized. In this example all the audio programs are provided as stereo baseband analog inputs. In this example none are provided by digital audio present on the SD-SDI inputs.

**Note 1:** In the example above, a third discrete Audio Encoder input will not be available for video inputs 5 and 6. However, the Secondary Audio for 5 and 6 can be used to provide the Video Descriptor Service instead of being used for a second language input.

**Note 2:** Detects ad insertion messages generated per SCTE 35 from multiple Cue Tone Audio inputs (user selectable).

**Note 3:** Detects ad insertion messages in a preset sequence per SCTE 35 activated by a contact closure (user selectable).

## General

<b>Dimensions (W x D x H):</b>	19.0 x 16.0 x 3.5 inches (483 x 406 x 89 mm); 2RU
<b>Power:</b>	
<b>Stock #6366:</b>	110-230VAC, 60/50Hz (Fuse: 3.0A, 250V, SloBlo)
<b>Stock #6366 48:</b>	-48VDC (Fuse: 2.0A, 250V SloBlo)
<b>Power Dissipation:</b>	100W (MAX)
<b>Weight:</b>	17 lbs (3.6 kg)
<b>Operating Temperature:</b>	32 to 122 °F (0 to 50 °C)
<b>Storage Temperature:</b>	-13 to 158 °F (-25 to 70 °C)

## Alarms/Monitoring/Control

<b>Local Monitoring:</b>	1x Input and 1x Status LEDs 1x Power LED 1x DVI Port 1x IP Reset button
<b>Local Control:</b>	
<b>Remote Monitoring/Control:</b>	GUI-based menu via Web browser (1x SFP rear-panel port; 10/100Base-T) (SFP module included) SD card based S/W upgrade (future option)

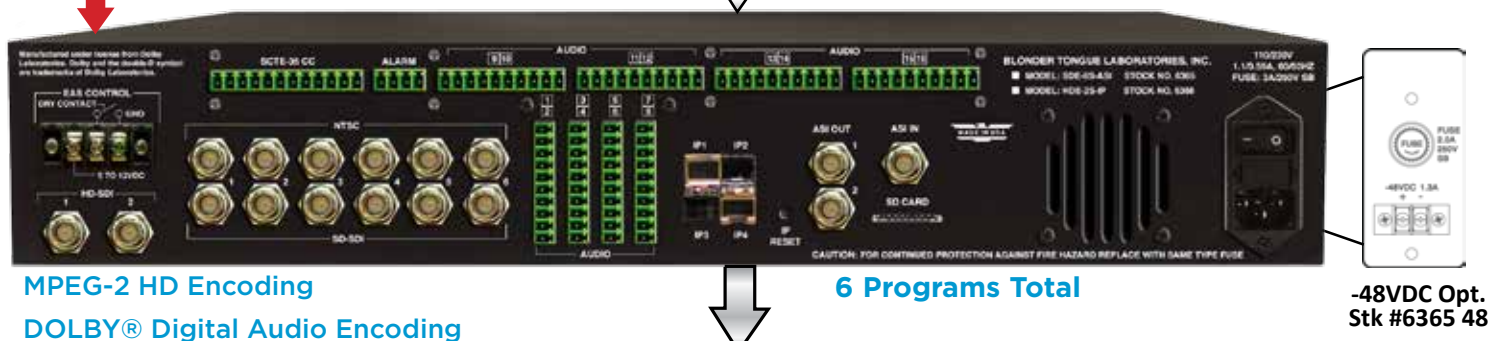
Model: **SDE-6S-ASI**

# Multiple Audio & Ad-Insertion

**6xSD-SDI or NTSC**

**EAS**

**6 Inputs Total**



**MPEG-2 HD Encoding**

**DOLBY® Digital Audio Encoding**

**6 Programs Total**

**1xIP + 2xASI**

(100/1000 BaseT SFP)  
(Fiber or Copper)

**-48VDC Opt.  
Stk #6365 48**

## Features

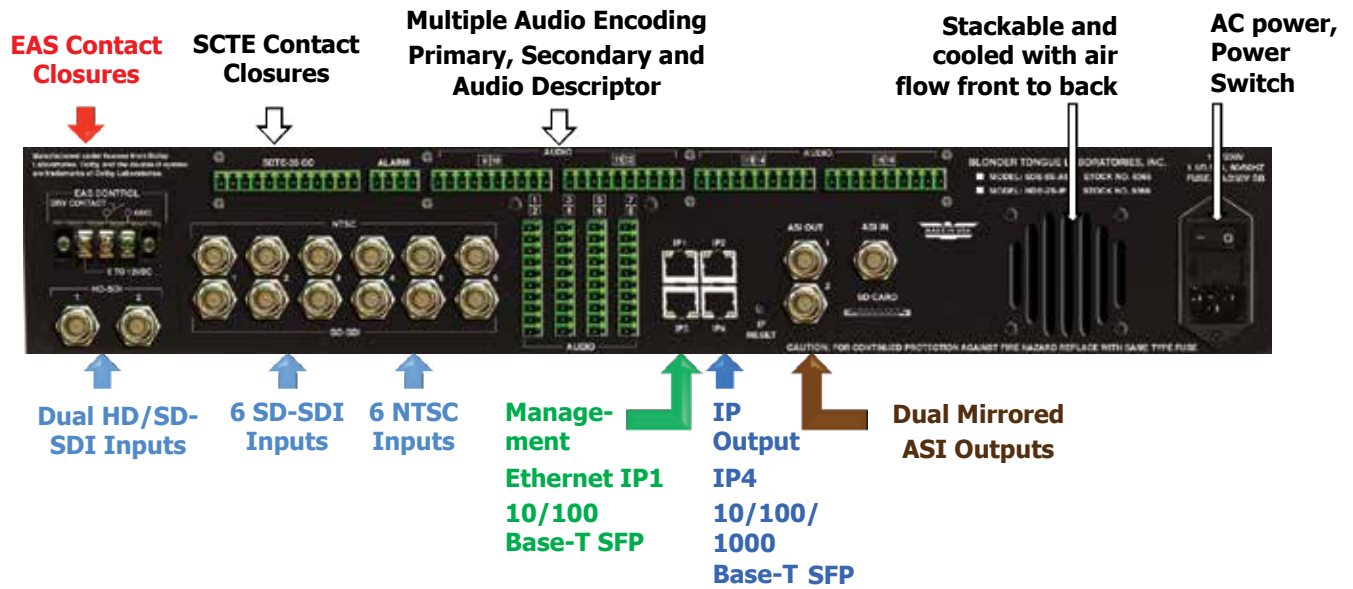
- Accepts up to six video programs from any of the following inputs: 6xSD-SDI and/or 6xNTSC
- Simultaneously delivers the following outputs: 2xASI (mirrored) and optional 1xIP (100/1000 BaseT)
- Provides comprehensive GUI-based monitoring and control using standard web browsers via 10/100 BaseT SFP module (included)
- Provides audio encoding for Primary Audio, SAP (Secondary Audio Program), & Audio Descriptor Service
- Provides user-selectable audio level adjustment of +/- 6 dB in 0.5 dB increments on all analog audio inputs through GUI interface
- Detects ad messaging via SCTE 35 activated by either multiple Cue Tone Audio inputs or upon contact closures (user selectable)
- Supports Closed Captioning EIA-608 and EIA-708
- Supports Real-time Dolby® Digital audio encoding
- Supports Emergency Alert System (EAS)
- Supports user-defined static PSIP configuration
- Supports compressed digital audio pass through for all SDI inputs
- Supports fixed VBR and Stat-Mux video encoding



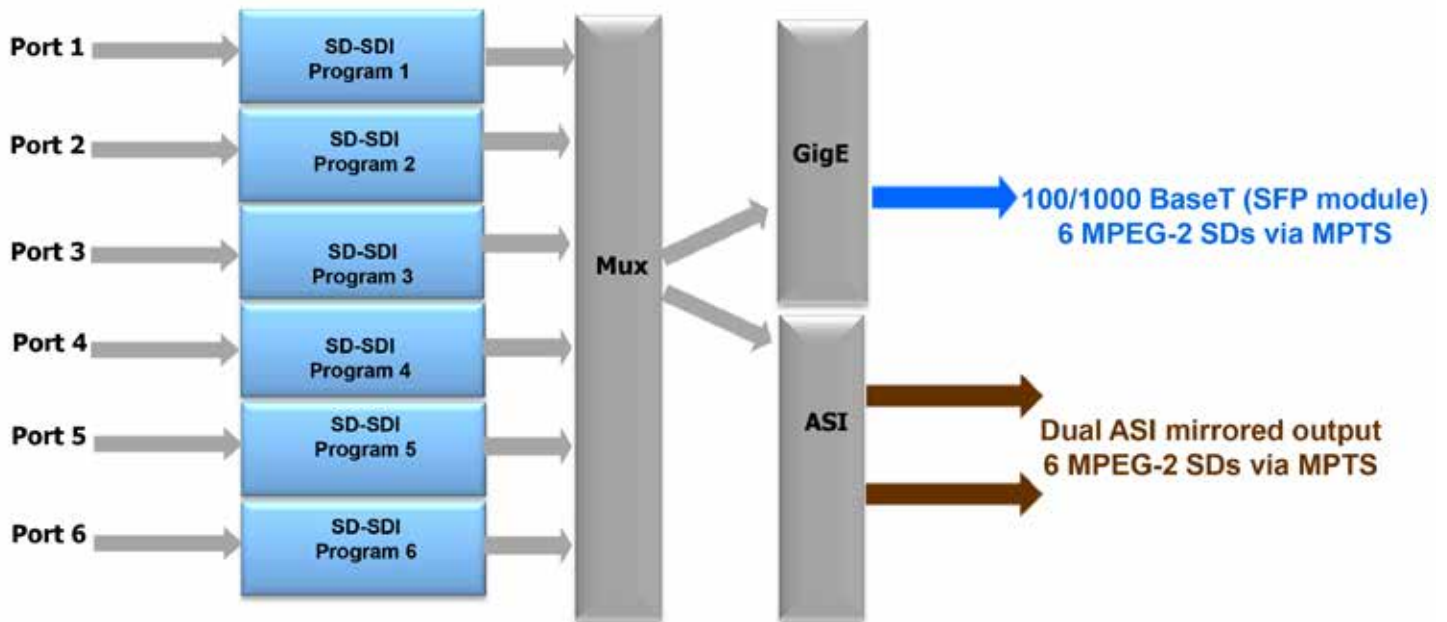
## Ordering Information

Model	Stock #	Description
SDE-6S-ASI	6365	MPEG-2 SD Encoder/Multiplexer (2 HD-SDI or 8 SD-SDI inputs); 110-230VAC
	6365 48	MPEG-2 HD/SD Encoder with -48VDC Power
SDE-6S-HD-LIC	6366-LIC	Software upgrade to <b>HDE-2S-IP (See Page 20)</b>

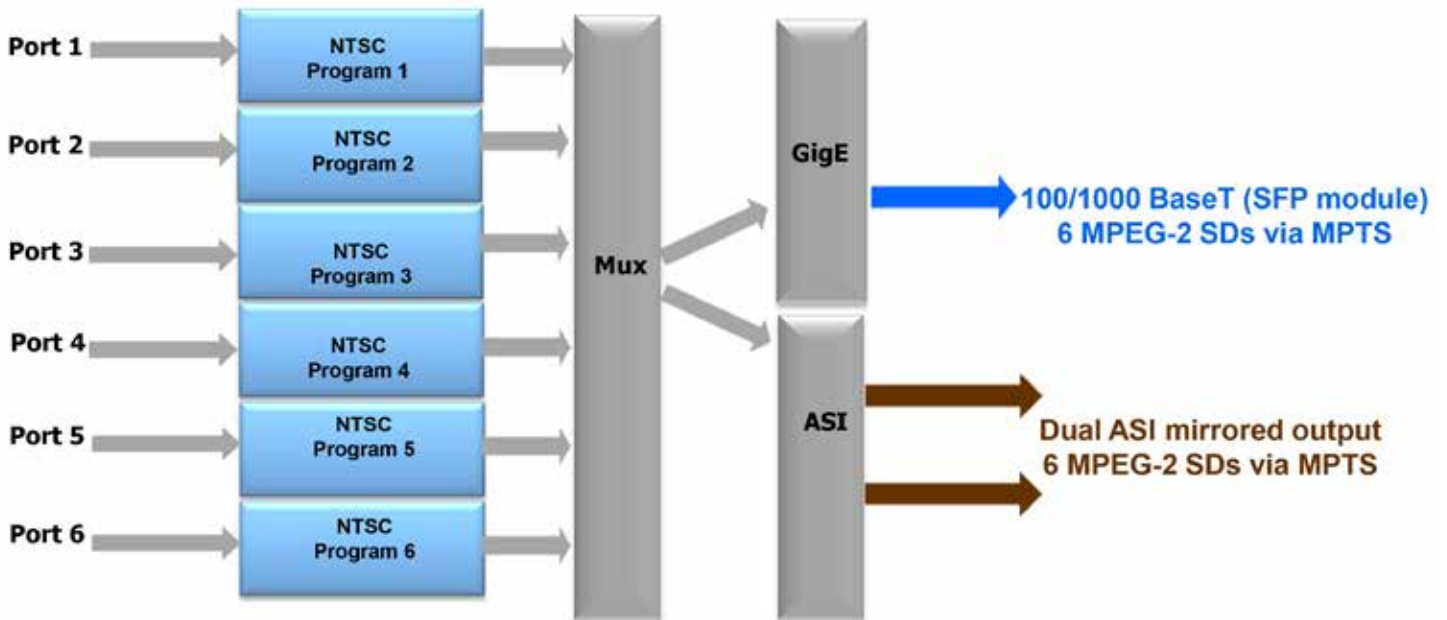
**MADE IN U.S.A.**



### 6 SD-SDI INPUT TO ASI/IP OUTPUT



### 6 NTSC INPUT TO ASI/IP OUTPUT





# Specifications

Model: **SDE-6S-ASI**

## INPUT

<b>SD-SDI</b>	<b>Connectors:</b> 6x BNC <b>Standard:</b> SMPTE 259M <b>Video Resolution:</b> 480i <b>Audio:</b> Embedded PCM and pass-through Dolby® Digital Analog Stereo Balanced Audio
<b>NTSC</b>	<b>Connectors:</b> 6x BNC for Analog Video 8x terminal strips for Analog Audio <b>Standard:</b> Analog Video <b>Video Resolution:</b> 525 lines per frame <b>Audio:</b> Analog Stereo Balanced Audio
<b>HD-SDI</b> (requires software upgrade)	<b>Connectors:</b> 2x BNC <b>Standard:</b> SMPTE 292M <b>Video Resolution:</b> 480i, 720p, & 1080i <b>Audio:</b> Embedded PCM and pass-thru Dolby® Digital Analog Stereo Balanced Audio (SD-SDI)
<b>EAS</b> (Emergency Alert System)	<b>Connectors:</b> <b>BNC:</b> Video (User-selectable NTSC 1 to 6) <b>Terminal:</b> Audio (User-selectable Audio 1 to 16) <b>Standard:</b> Analog Audio/Video <b>Trigger Mechanism:</b> 5-12 VDC & Dry Contact Closure (Terminal Strip)

<b>Encoding Profile</b>	
<b>Video</b>	<b>Output Format:</b> MPEG-2 MP@ML, ISO 13818-2 <b>Chroma:</b> 4:2:0 <b>Resolution:</b> 480i <b>Frame rate:</b> 29.97 fps (480i) <b>Aspect Ratio:</b> 4:3 <b>GOP Structure:</b> I & P frames (user-selectable) <b>Transport Rate:</b> Variable (user-selectable) <b>Video Rate:</b> Variable (user-selectable) <b>Video Pre-filter:</b> Variable (user-selectable) <b>Color Space:</b> YCbCr
<b>Audio</b>	<b>Output Format:</b> Dolby® Digital <b>Sampling rate:</b> 48 kHz <b>Bit rate:</b> Variable; 96-448 Kbps (user-selectable) <b>Level Adjustment:</b> ± 6 dB, 1 dB increment (user-selectable)
<b>Digital Program Insertion (DPI)</b>	<b>Connectors:</b> Terminal strip for Cue Tone Audio <b>Standard:</b> SCTE 35
<b>Closed Captioning</b>	<b>SD-SDI:</b> EIA-608, EIA 708; (Embedded in input) <b>NTSC:</b> EIA-608 (Embedded in input)

## General

<b>Dimensions (W x D x H):</b>	19.0 x 16.0 x 3.5 inches (483 x 406 x 89 mm); 2RU
<b>Power:</b>	110-230VAC, 60/50Hz (Fuse: 3.0A, 250 VPC, SloBlo)
<b>Power Dissipation:</b>	100W (max)
<b>Weight:</b>	17 lbs (3.6 kg)
<b>Operating Temperature:</b>	32 to 122 °F (0 to 50 °C)
<b>Storage Temperature:</b>	-13 to 158 °F (-25 to 70 °C)
<b>Operating Humidity:</b>	0 to 95% RH @ 35 °C max, non-condensing
<b>Storage Humidity:</b>	0 to 95% RH @ 35 °C max, non-condensing

## OUTPUT

<b>ASI</b>	<b>Connector:</b> 2x BNC (Rear-panel) <b>Format:</b> DVB-ASI <b>Standard:</b> ETSI EN 50083-9
<b>IP* Optional</b>	<b>Connector:</b> 1x SFP (Rear-panel) <b>Standard:</b> IEEE 802.3 100/1000 Base-T Ethernet <b>Network Protocols:</b> UDP, RTP, multicast, unicast, MPTS output

## Baseband Analog Audio Encoding

SD-SDI or NTSC Video Input #	1	2	3	4	5	6
<b>Primary Audio</b>	Y	Y	Y	Y	Y	Y
<b>Secondary Audio</b>	Y	Y	Y	Y	Y	Y
<b>Video Descriptor Audio</b>	Y	Y	Y	Y	Note 1	Note 1
<b>Cue Tone Audio</b>	Note 2	Note 2	Note 2	Note 2	Note 2	Note 2
<b>Cue Tone via Contact Closure</b>	Note 3	Note 3	Note 3	Note 3	Note 3	Note 3

There are a total of sixteen (16) stereo analog audio encoding engines in the unit. The table above illustrates one example of how this resource may be utilized. In this example all the audio programs are provided as stereo baseband analog inputs. In this example none are provided by digital audio present on the SD-SDI inputs.

**Note 1:** In the example above, a third discrete Audio Encoder input will not be available for video inputs 5 and 6. However, the Secondary Audio for 5 and 6 can be used to provide the Video Descriptor Service instead of being used for a second language input.

**Note 2:** Detects ad insertion messages generated per SCTE 35 from multiple Cue Tone Audio inputs (user selectable).

**Note 3:** Detects ad insertion messages in a preset sequence per SCTE 35 activated by a contact closure (user selectable).

## Alarms/Monitoring/Control

<b>Local Monitoring:</b>	1x Input and 1x Status LEDs 1x Power LED 1x DVI Port
<b>Local Control:</b>	1x IP Reset button
<b>Remote Monitoring/Control:</b>	GUI-based menu via Web browser (1x SFP rear-panel port; 10/100Base-T) SD card based S/W upgrade (future option)

Model: **MPHDE-50**

SEE HDE-CSV-QAM ON PAGE 30

## Streamline Delivery & Management of Custom HD Video Content

**1xComponent/1xHD-SDI/1xHDMI/1xVGA/1xComposite**



**1xQAM + 1xIP + 1xASI**

### Features

#### Media Player Section:

- Enhanced bit rate for 1080i output
- Android-based Operating System
- Networked controlled API
- 10/100/1000T-base Ethernet port for remote mgmt
- API for native applications
- 4 GB Flash internal memory
- SD Card port for additional storage/memory

#### Digital Signage Key Points:

- Video Playback: MPEG-2 and MPEG-4/H.264
- Image File Playback: PNG and JPEG
- Calendar
- Clock
- RSS News
- Twitter Feed
- Web Page Integration

#### Encoder Section (See following page):

- Simultaneously delivers the following outputs: 1xQAM, 1xASI, and 1xIP
- Provides +40 dBmV QAM RF output levels
- Provides comprehensive GUI-based monitoring and control via standard Web browsers
- Supports Real-time Dolby® Digital audio encoding
- Supports user-defined PSIP configuration
- Supports Closed Captioning EIA-608 and EIA-708

### Solutions

#### MSO's:

- Enhanced bit rate for 1080p output
- Android-based Operating System
- Networked controlled API

#### Hotels:

- Greeting information (date, time, temp, etc.)
- Local area points of interest (restaurants, shopping centers, etc.)

#### Schools:

- Daily activities
- Weekly Schedules
- Transportation routes

#### Universities/Government:

- Campus diagrams of buildings, locations, phone numbers
- Local Restaurants, dry cleaners, theaters, etc.

### Ordering Information

Model	Stock #	Description
MPHDE-50	6385	Media Player & HD Encoder; 120 VAC
MADE IN U.S.A.	6385-48	Media Player & HD Encoder, -48 VDC

**CALL FOR MORE INFO**

## INPUT

<b>Component</b>	<b>Connectors:</b> 3x RCA for Video (Y, Pb, Pr) <b>Video Resolution:</b> 480i, 720p, & 1080i <b>Video Aspect Ratio:</b> 4:3 & 16:9 <b>Audio:</b> 2x RCA for Analog Audio (L, R) 1x RCA for Digital Audio (PCM)
<b>HD-SDI</b>	<b>Connector:</b> 1x BNC <b>Standard:</b> SMPTE 292M <b>Video Resolution:</b> 480i, 720p, & 1080i <b>Audio:</b> Embedded PCM and pass-through Dolby® Digital only
<b>HDMI</b>	<b>Connector:</b> 1x HDMI <b>Video Resolution:</b> 480i, 720p, & 1080i <b>HDCP Encryption:</b> Not supported <b>Audio:</b> Embedded PCM and pass-through Dolby® Digital only
<b>VGA</b>	<b>Connectors:</b> 2x Female VGA (Input + Loop-through Output) <b>Video Resolution:</b> 640x480 @ 60 fps 800x600 @ 60 fps 1024x768 @ 60 fps <b>Audio:</b> 2x RCA for Analog Audio (L, R) 1x RCA for Digital Audio (PCM)
<b>Composite Video</b>	<b>Connectors:</b> 1x RCA for Video (Y) <b>Video Resolution:</b> 480i <b>Audio:</b> 2x RCA for Analog Audio (L, R) 1x RCA for Digital Audio (PCM)

<b>Encoding Profile</b>	
<b>Video</b>	<b>Output Format:</b> MPEG-2 HD MP@ML; ISO 13818-2 <b>Chroma:</b> 4:2:0 <b>Resolution:</b> 480i, 720p, & 1080i <b>Frame rate:</b> 29.97 fps (480i); 29.97 fps (1080i); 59.97 fps (720p) <b>Aspect Ratio:</b> 4:3 & 16:9 <b>GOP Structure:</b> I & P frames (user-selectable) <b>Transport Rate:</b> Variable (user-selectable) <b>Video Bit Rate:</b> Variable (user-selectable) <b>Video Pre-filter:</b> Variable (user-selectable) <b>Color Space:</b> YCbCr and RGB
<b>Audio</b>	<b>Output Format:</b> Dolby® Digital <b>Sampling rate:</b> 48 kHz <b>Bit rate:</b> Variable; 128-320 Kbps (user-selectable)
<b>Closed Captioning</b>	<b>Component:</b> EIA- 608; 1x RCA (CC) <b>HD-SDI:</b> EIA- 708; Embedded in HD-SDI input <b>HDMI:</b> EIA- 608; 1x RCA (CC) <b>VGA:</b> EIA- 608; 1x RCA (CC) <b>Composite:</b> EIA- 608

## General

<b>Dimensions (W x D x H):</b>	19.0 x 14.0 x 1.75 inches (483 x 356 x 45 mm)
<b>Power:</b>	Stock# 6385: 100 - 240 VAC (50/60 Hz)
	Stock# 6385-48: - 48 VDC
<b>Power Dissipation:</b>	30 W
<b>Weight:</b>	10 lbs (? kg)
<b>Operating Temperature:</b>	32 to 104 °F (0 to 40 °C)
<b>Storage Humidity:</b>	5 to 85% RH @ 40 °C max, non-condensing

## OUTPUT

<b>QAM</b>	<b>Connector:</b> 1x "F" Female (rear panel) <b>Modulation:</b> QAM 16, 32, 64, 128, and 256 <b>Standards:</b> ITU-T J.83; Annex A and B <b>DVB Symbol Rate:</b> Variable; up to 7 MSymbol/sec (MBaud) <b>Frequency Range:</b> 54 to 1002 MHz <b>Tuning:</b> CATV Channel Selectable (CH. 2 to 158) <b>Channel Bandwidth:</b> 6 MHz <b>RF Level:</b> +40 dBmV ± 1 dB (4 channels combined) <b>RF Level Adjustment Range:</b> +32 to +42 dBmV, 1 dB increment <b>Frequency Tolerance:</b> ± 0.5 kHz @ 77 °F (25 °C) <b>Frequency Stability:</b> ± 5 kHz over 32 to 122 °F (0 to 50 °C) <b>Amplitude Flatness:</b> ± 0.25 dB (over 6 MHz channel) <b>Phase Noise:</b> -98 dBc (@ 10 kHz) <b>Spurious:</b> -60 dBc <b>Broadband Noise:</b> -70 dBc (@ +40 dBmV output level, 5.5 MHz bandwidth) <b>Impedance:</b> 75 Ω <b>Spectral Inversion:</b> Auto Recognition <b>Carrier Suppression:</b> 45 dB <b>Return Loss:</b> 14 dB typical <b>Signal-to-Noise Ratio (SNR):</b> 40 dB typical <b>MER:</b> 40 dB typical <b>I/Q Phase Error:</b> Less than 1 degree <b>I/Q Amplitude Imbalance:</b> Less than 1%
<b>ASI</b>	<b>Connector:</b> 1x BNC (front-panel) <b>Format:</b> DVB-ASI <b>Standard:</b> ETSI EN 50083-9
<b>IP</b>	<b>Connector:</b> 1x RJ45 (front-panel) <b>Format:</b> 10/100Base-T Ethernet <b>Standard:</b> Supported (user-selectable)

## MEDIA PLAYER SPECIFICATIONS

### INPUT/OUTPUT

<b>Video Input:</b>	(1x) Ethernet 10/100 BASE-T (2x) USB 2.0 High Speed
<b>Video Output:</b>	HDMI (full HD 1080p with audio) Composite Video
<b>Audio Output:</b>	3.5mm (part of Composite Analog Output)

<b>Internal Storage:</b>	4 GB Flash Memory (Approx. 180 minutes of 720p video @ 3.0 mbps) SD Card Slot for Memory Expansion up to 32GB SD/SDHC Card
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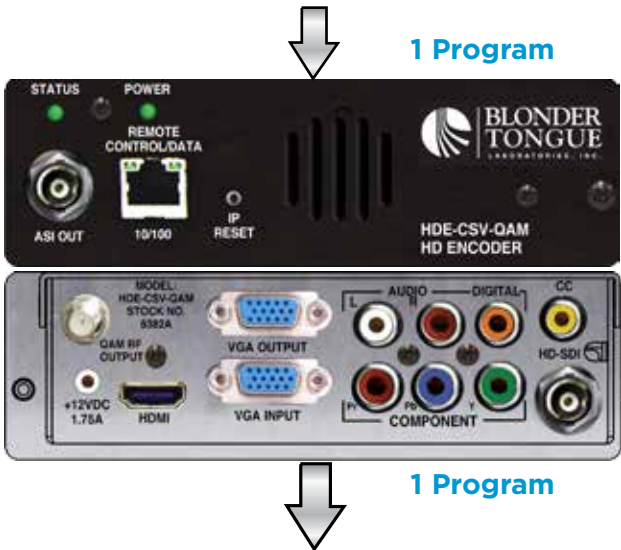
### Files Supported

<b>Image Files:</b>	JPEG (480p baseline, 720p baseline) PNG (480p, 720p)
<b>Video Files:</b>	MPEG-2 (480p, 720p) MPEG-4 / H.264 (480p, 720p, 1080p) VC1 / WMV9 (720p)
<b>Other Media:</b>	RSS Feeds (requires live Internet connectivity) Web Page (requires live Internet connectivity) Twitter® Feed (requires live Internet connectivity)

Model: **HDE-CSV-QAM**

# Designed for Digital Signage Applications

**1xComponent/1xHD-SDI/  
1xHDMI/1xVGA/1xComposite**



**MPEG-2 HD Encoding  
DOLBY® Digital Audio Encoding**

**1xQAM + 1xIP + 1xASI**

## Features

- Accepts one program from any of the following inputs: 1xComponent, 1xHD-SDI, 1xHDMI (unencrypted), 1xVGA, and 1xComposite
- Simultaneously delivers the following outputs: 1xQAM, 1xIP, and 1xASI
- Provides a rear-panel VGA output port available for loop-through monitoring
- Provides +40 dBmV QAM RF output level
- Provides comprehensive GUI-based monitoring and control via standard Web browsers
- Compact design permits installation of up to 3 Encoder modules in 1RU
- Supports Real-time Dolby® Digital audio encoding
- Supports user-defined PSIP configuration
- Supports Closed Captioning EIA-608 and EIA-708



## Ordering Information

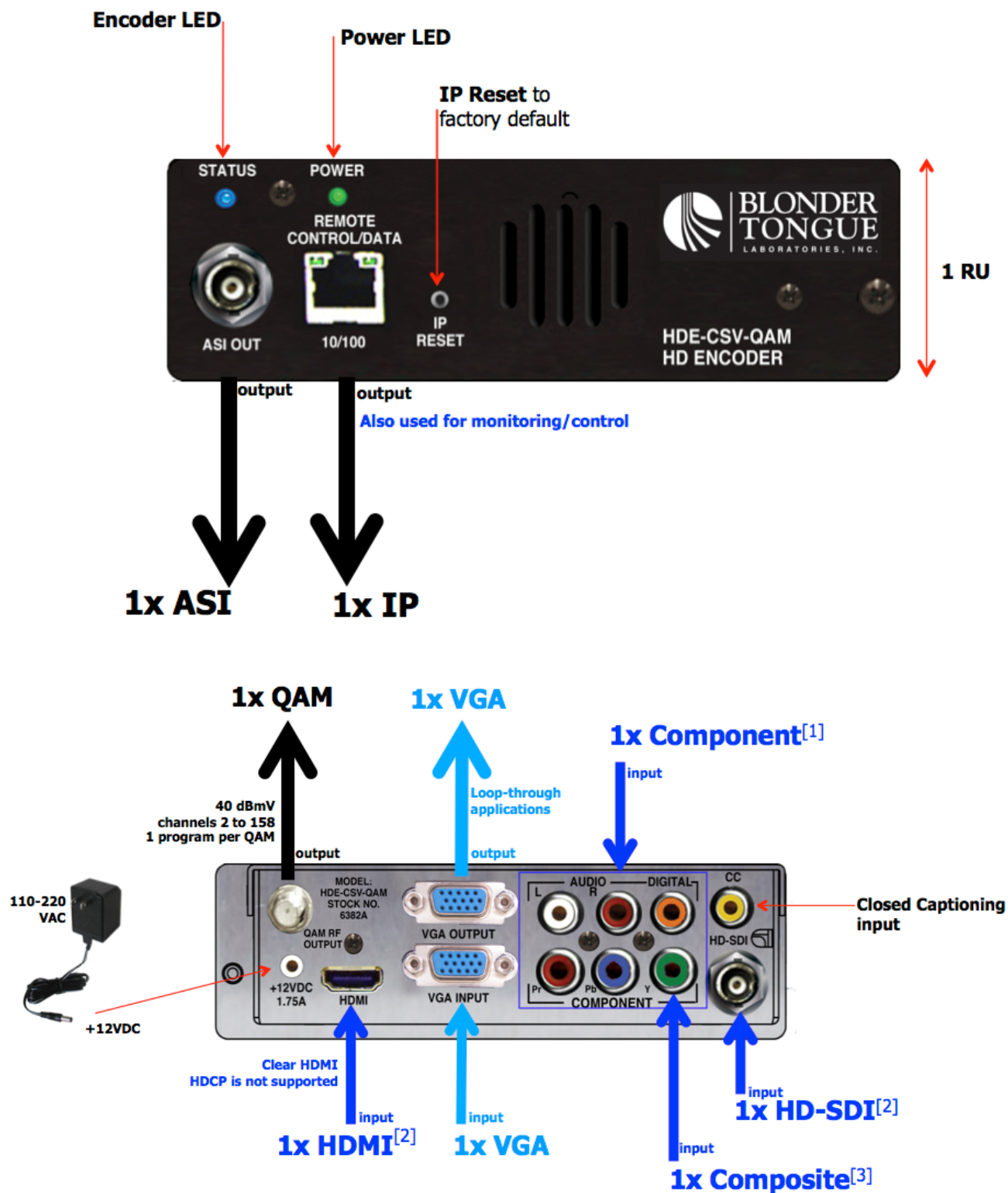
Model	Stock #	Description
HDE-CSV-QAM	6382A	MPEG-2 HD Encoder; 1xComponent, 1xHD-SDI, 1xHDMI, 1xVGA, 1xComposite inputs; 1xQAM + 1xIP + 1xASI outputs
<b>HDE-CHV-QAM</b>	<b>6384A</b>	<b>MPEG-2 HD Encoder; 1xComponent, 1xHDMI, 1xVGA, 1xComposite inputs; 1xQAM + 1xIP + 1xASI outputs</b>
HDE-3MCH	6389	1RU Rack-mount chassis; holds 3 models



**MADE IN U.S.A.** Model: HDE-3MCH Stock No. 6389 Rack-mount Chassis

**CALL FOR  
MORE INFO**



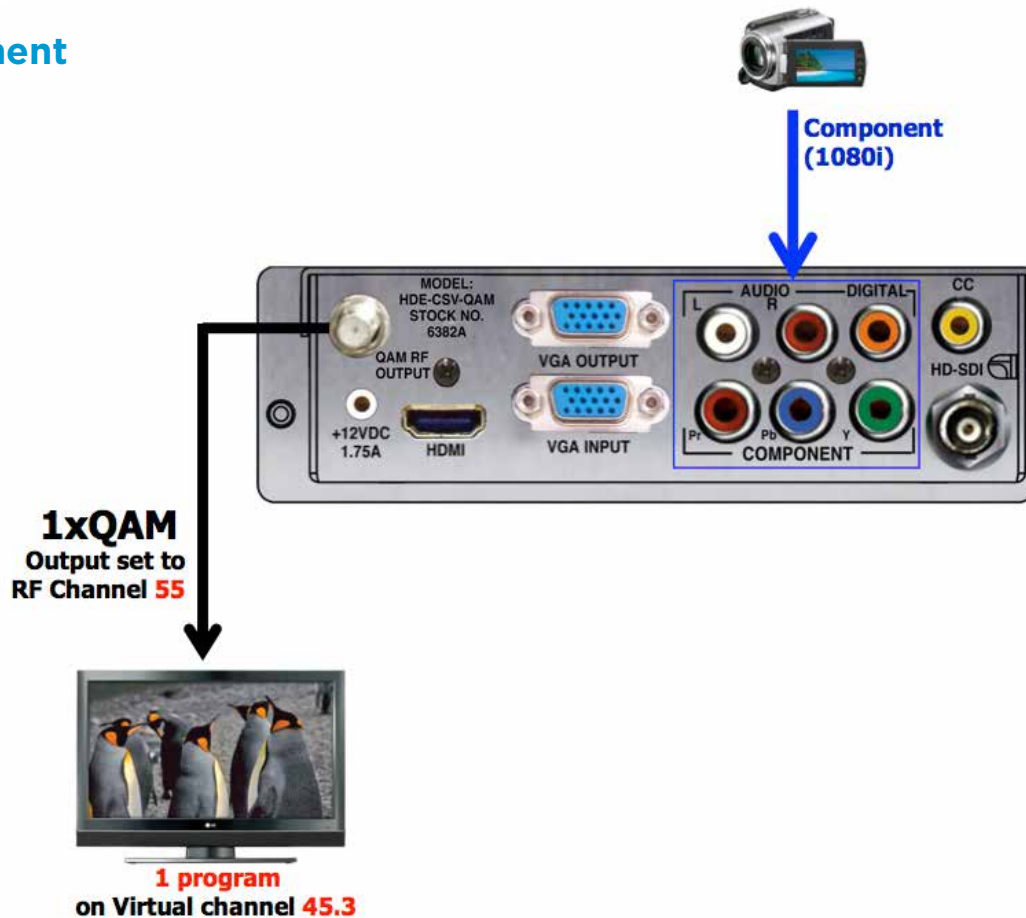


- [1] The encoder accepts both analog and digital audio inputs. If both inputs are present, the encoder will process the analog as the primary audio source.
- [2] The encoder accepts analog NTSC Closed Captioning (EIA-608, also known as Line 21) from a Composite source, digitizes and then inserts it in the MPEG-2 Transport Stream of the HDMI encoded input. The encoder also supports EIA-708 if Closed Captioning is embedded in the HD-SDI input.
- [3] The Analog L/R audio connectors are shared with the component input.

## 1xHD-SDI



## 1xComponent



# Specifications

Model: **HDE-CSV-QAM**

## INPUT

<b>Component</b> <b>Connectors:</b> <b>Video Resolution:</b> <b>Video Aspect Ratio:</b> <b>Audio:</b>	3x RCA for Video (Y, Pb, Pr) 480i, 720p, & 1080i 4:3 & 16:9 2x RCA for Analog Audio (L, R) 1x RCA for Digital Audio (PCM)
<b>HD-SDI</b> <b>Connector:</b> <b>Standard:</b> <b>Video Resolution:</b> <b>Audio:</b>	1x BNC SMPTE 292M 480i, 720p, & 1080i Embedded PCM and pass-through Dolby® Digital only
<b>HDMI</b> <b>Connector:</b> <b>Video Resolution:</b> <b>HDCP Encryption:</b> <b>Audio:</b>	1x HDMI 480i, 720p, & 1080i Not supported Embedded PCM & pass-through Dolby® Digital only
<b>VGA</b> <b>Connectors:</b> <b>Video Resolution:</b> <b>Audio:</b>	2x Female VGA (Input + Loop-through Output) 640x480 @ 60 fps 800x600 @ 60 fps 1024x768 @ 60 fps 2x RCA for Analog Audio (L, R) 1x RCA for Digital Audio (PCM)
<b>Composite</b> <b>Connectors:</b> <b>Video Resolution:</b> <b>Audio:</b>	1x RCA for Video (Y) 480i 2x RCA for Analog Audio (L, R) 1x RCA for Digital Audio (PCM)

<b>Encoding Profile</b> <b>Video</b> <b>Output Format:</b> <b>Chroma:</b> <b>Resolution:</b> <b>Frame rate:</b> <b>Aspect Ratio:</b> <b>GOP Structure:</b> <b>Transport Rate:</b> <b>Video Bit Rate:</b> <b>Video Pre-filter:</b> <b>Color Space:</b>	MPEG-2 HD MP@ML; ISO 13818-2 4:2:0 480i, 720p, & 1080i 29.97 fps (480i); 29.97 fps (1080i); 59.97 fps (720p) 4:3 & 16:9 I & P frames (user-selectable) Variable (user-selectable) Variable (user-selectable) Variable (user-selectable) YCbCr and RGB
<b>Audio</b> <b>Output Format:</b> <b>Sampling rate:</b> <b>Bit rate:</b>	Dolby® Digital 48 kHz Variable; 96 - 448 Kbps (user-selectable)
<b>Closed Captioning</b> <b>Component:</b> <b>HD-SDI:</b> <b>HDMI:</b> <b>VGA:</b> <b>Composite:</b>	EIA- 608; 1x RCA (CC) EIA-708; Embedded in HD-SDI input EIA- 608; 1x RCA (CC) EIA- 608; 1x RCA (CC) EIA- 608

## OUTPUT

<b>QAM</b> <b>Connector:</b> <b>Modulation:</b> <b>Standards:</b> <b>DVB Symbol Rate:</b> <b>Frequency Range:</b> <b>Tuning:</b> <b>Channels' Bandwidth:</b> <b>RF Level:</b> <b>RF Level Adjustment:</b> <b>Frequency Tolerance:</b> <b>Frequency Stability:</b> <b>Amplitude Flatness:</b> <b>Phase Noise:</b> <b>Spurious:</b> <b>Broadband Noise:</b> <b>Impedance:</b> <b>Spectral Inversion:</b> <b>Carrier Suppression:</b> <b>Return Loss:</b> <b>Signal-to-Noise Ratio (SNR):</b> <b>MER:</b> <b>I/Q Phase Error:</b> <b>I/Q Amplitude Imbalance:</b>	1x "F" Female (Rear-panel) QAM 16, 32, 64, 128, and 256 ITU-T J.83; Annex A and B Variable; up to 7 MSymbol/sec (MBaud) 54 to 1002 MHz CATV Channel Selectable (Ch. 2 to 158) 6 MHz +40 dBmV ±1 dB +32 to +42 dBmV, 1 dB increment ± 0.5 kHz @ 77 °F (25 °C) ± 5 kHz over 32 to 122 °F (0 to 50 °C) ± 0.25 dB (over 6 MHz channel) -98 dBc (@ 10 kHz) -60 dBc -70 dBc (@ +40 dBmV output level, 5.5 MHz bandwidth) 75 Ω Auto Recognition 45 dB 14 dB typical 40 dB typical 40 dB typical Less than 1 degree Less than 1%
<b>ASI</b> <b>Connectors:</b> <b>Format:</b> <b>Standard:</b>	1x BNC (Front-panel) DVB-ASI ETSI EN 50083-9
<b>IP</b> <b>Connector:</b> <b>Standard:</b> <b>UDP/RTP:</b>	1x RJ45 (Front-panel) 10/100Base-T Ethernet Supported (user-selectable)

## General

<b>Dimensions (W x D x H):</b>	5.65 x 12.5 x 1.75 inches (144 x 317.5 x 44.5 mm)
<b>Power:</b>	External Power Supply (Input 115-230VAC / Output 12VDC @ 3 Amp)
<b>Power Dissipation:</b>	20 W
<b>Weight (one module):</b>	1.5 lbs (0.7 kg)
<b>Operating Temperature:</b>	32 to 122 °F (0 to 50 °C)
<b>Storage Temperature:</b>	-13 to 158 °F (-25 to 70 °C)
<b>Operating Humidity:</b>	0 to 95% RH @ 35 °C max, non-condensing
<b>Storage Humidity:</b>	0 to 95% RH @ 35 °C max, non-condensing

## Alarms/Monitoring/Control

<b>Local Monitoring:</b>	1x Status LED 1x Power LED
<b>Local Control:</b>	1x IP Reset button
<b>Remote Monitoring/Control:</b>	GUI-based menu via standard Web browsers (1x RJ45 front-panel connector; 10/100Base-T, also used for IP output)

Model: **HDE-2H/2S-QAM**

**2xHDMI + 2xHD-SDI +  
4xComponent/Composite**



MPEG-2 HD Encoding

DOLBY® Digital Audio Encoding

**4xQAM + 4xIP + 4xASI**  
(Adjacent) (GigE)

## Features

- Accepts up to four programs from any of the following inputs: 2xHDMI (unencrypted), 2xHD-SDI, and 4xComponent/Composite
- Simultaneously delivers the following outputs: 4xQAM, 4xIP, and 4xASI
- Multiplexes up to four input programs in any of the following output combinations:
  - (i) 1:1 (1 program per QAM channel)
  - (ii) 2:1 (2 programs per QAM channel, not exceeding 38.8 Mbps)
  - (iii) 3:1 (3 programs per QAM channel, not exceeding 38.8 Mbps)
  - (iv) 4:1 (4 programs per QAM channel, not exceeding 38.8 Mbps)
- Each of the four QAM channels can contain 1 or 2 programs, and be turned on/off individually
- Provides +52 dBmV QAM output level for four combined channels (+60 dBmV for 1 QAM)
- Provides comprehensive GUI-based monitoring and control via standard Web browsers
- Supports Closed Captioning EIA-608 and EIA-708
- Equipped with EAS interface (Analog Video + L/R Audio)
- Supports Real-time Dolby® Digital audio encoding
- Supports user-defined PSIP configuration



## Ordering Information

Model	Stock #	Description
HDE-2H/2S-QAM	6379A	MPEG-2 HD Encoder; 2xHDMI + 2xHD-SDI + 4xComponent/Composite inputs; 4xQAM + 4xIP + 4xASI outputs, EAS compatible

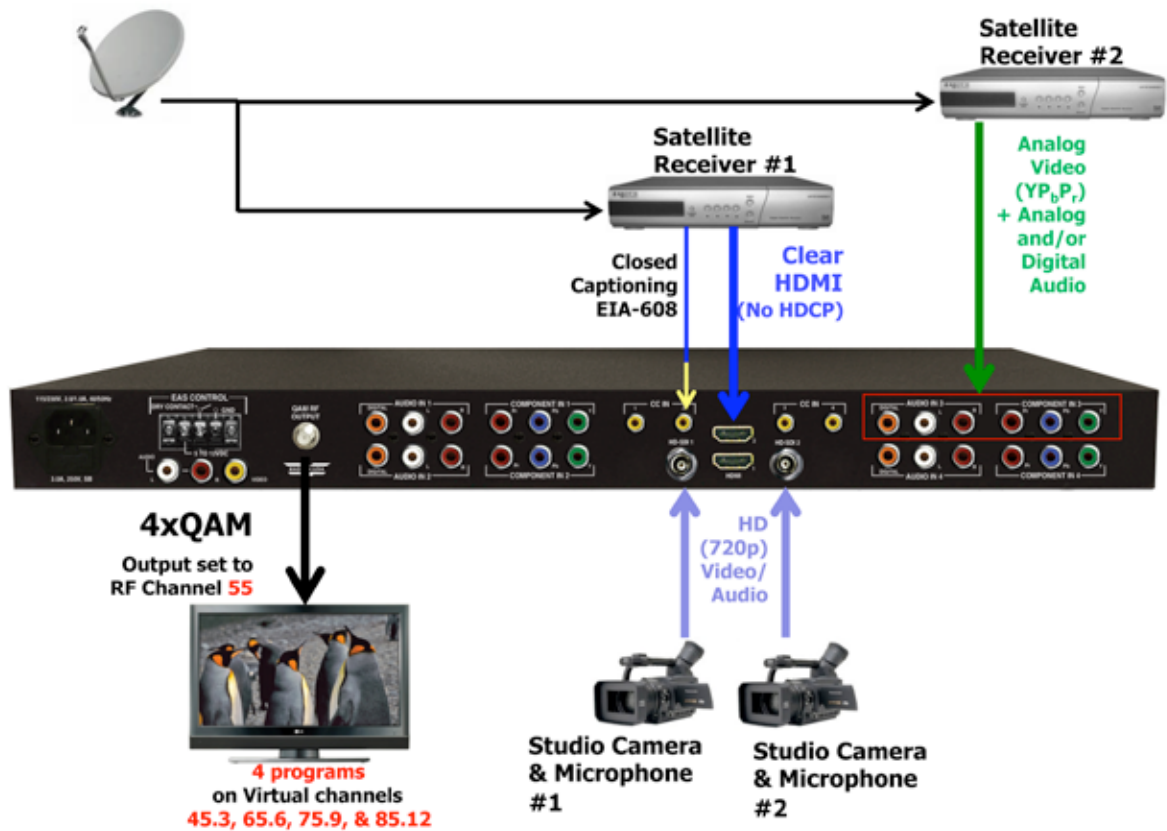
MADE IN U.S.A.



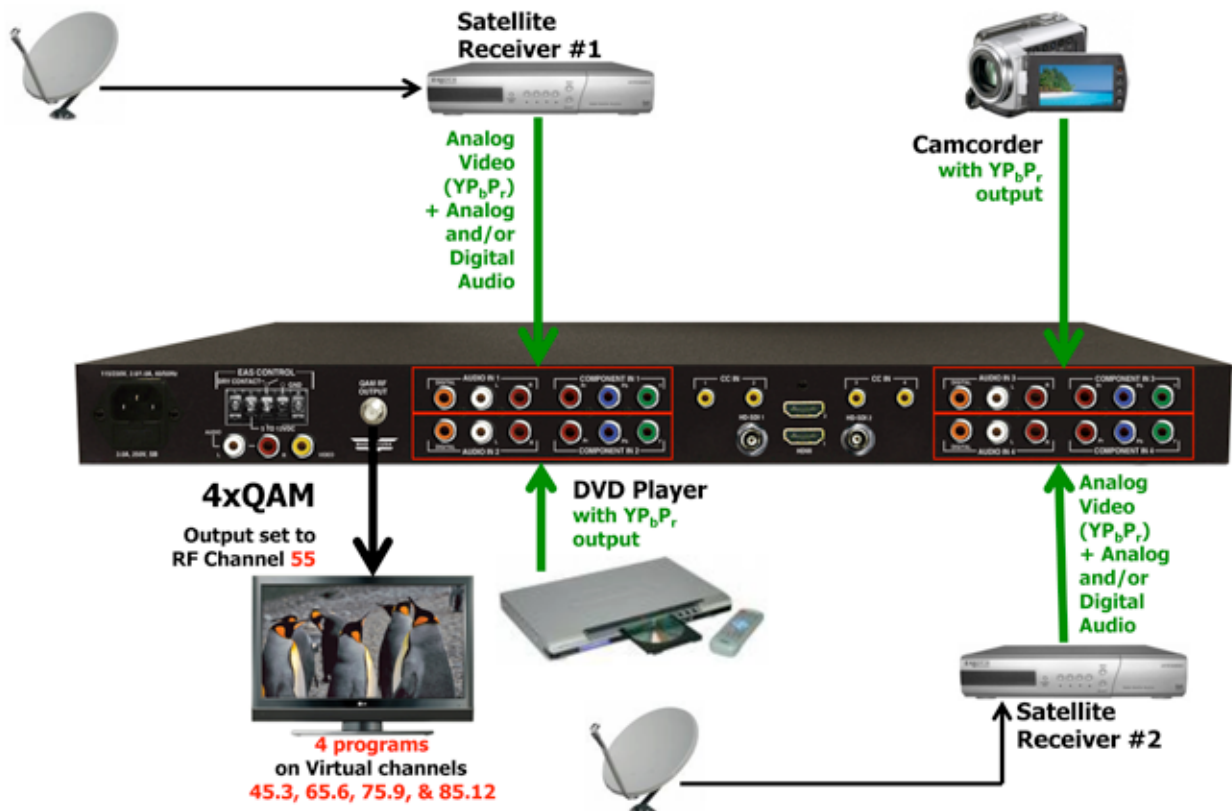
# Solutions

Model: **HDE-2H/2S-QAM**

**1xHDMI + 2xHD-SDI + 1xComponent**



**4xComponent**



# Model: EQAM-420B

2xIP  
(GigE)

Mode 1  
64 SPTS

Mode 2  
12 or 16 MPTS<sup>[1]</sup>  
Clear GbE

EAS  
(SCTE-18 Compliant)



[1] 12 or 16 MPTS depending on the result of engineering study

16xQAM (Clear/Pro:Idiom™)  
CONTENT SECURITY

## Features

- SPTS Mode: Accepts up to sixty four MPEG-2/H.264 Single Program Transport Streams (SPTS); 1 video + 1 audio per program
- MPTS Mode: Accepts up to sixteen MPEG-2/H.264 Multi Program Transport Streams (MPTS), each MPTS with max of six programs (not to exceed 38.8 Mbps) 1 video + 3 audios per program
- Supports IGMPv2 and IGMPv3 protocols
- MPEG Table Preservation ensures proper program information is undisturbed
- PMT & PID values are passed through without change (re-mapping of MPEG tables, not allowed)
- SNMPv2 management interface

## Benefits

- System is easily sized for any system - From 1 to 100's of channels
- Simple network connections for content input and conversion to QAM standard while operations and management occur on separate networks
- No waiting for other message servers queuing or message downloads
- Message replaces program video and audio to assure impactful reception to viewing audience while alert tones cue casual viewers to pay attention
- System configurable to support warnings from Federal (FEMA-IPAWS), State, Tribal, Local, and Private groups
- Use any standard web-browser on PC's, Mac's, and Smart phones to view change or activate functions - anywhere, over an IP network.
- Single wire, network interface simplifies installation, setup, and assures proper operation



Edge & IPTV

## Ordering Information

Model	Stock #	Description
EQAM-420B-4-64	6522B-4-64	Equipped with 4 Quad-QAM output modules (accepts 64 unencrypted HD programs)
EQAM-420B-PIL	6522B-PIL	Software option to add Pro:Idiom™ encryption

MADE IN U.S.A.

**QAM RF Test Interface**  
allows monitoring/testing  
of the QAM output  
without service  
interruption

**Output Status LEDs**  
indicate the presence  
and status of the four  
QAM output modules

Reserved for  
future use

(i) **Receives Soft/IP Trigger for EAS** based on SCTE-18  
standard

(ii) **Comprehensive remote monitoring and control** is  
accomplished using any standard Web browser via this  
10/100BaseT Ethernet interface



**INPUT**  
Up to 64x HD programs  
2x 1000BaseT Ethernet (GbE)  
Unencrypted (clear)

**Power LED**

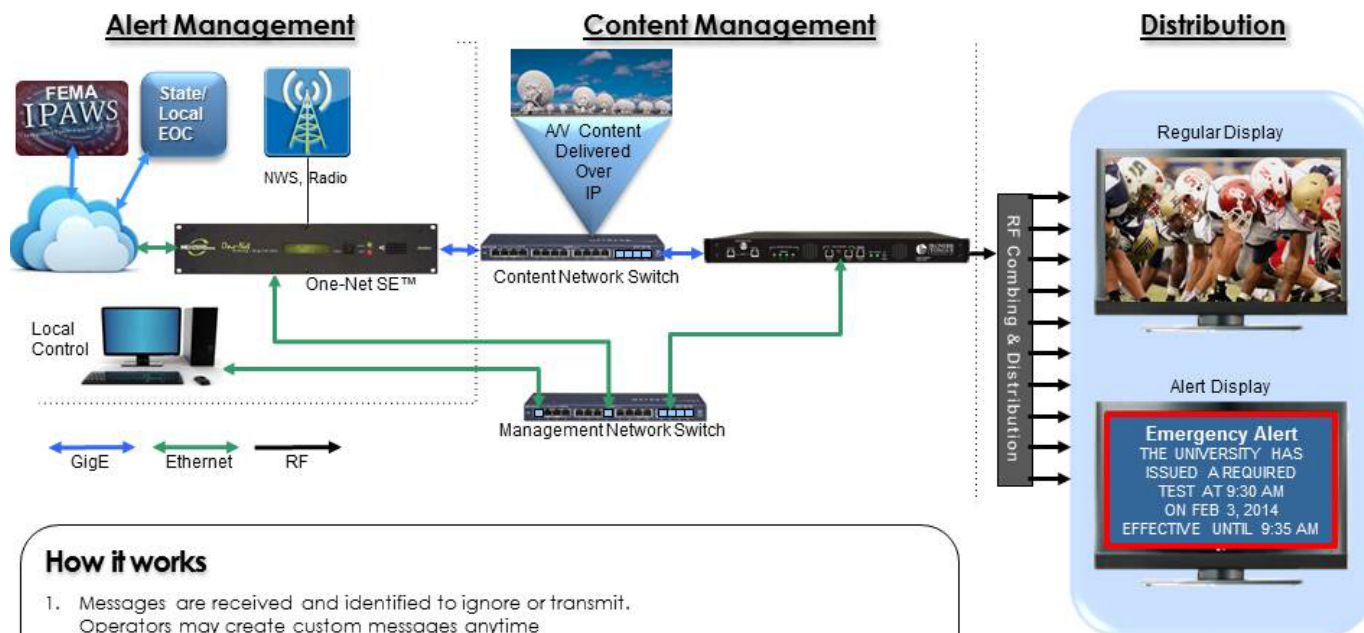
**Status LED**

**IP Reset** to  
factory default

**16x QAM Outputs**  
Clear/Pro:Idiom™ Encrypted  
40 dBmV combined output level  
Supports CATV channels 2 to 157  
Allows 4 programs per QAM

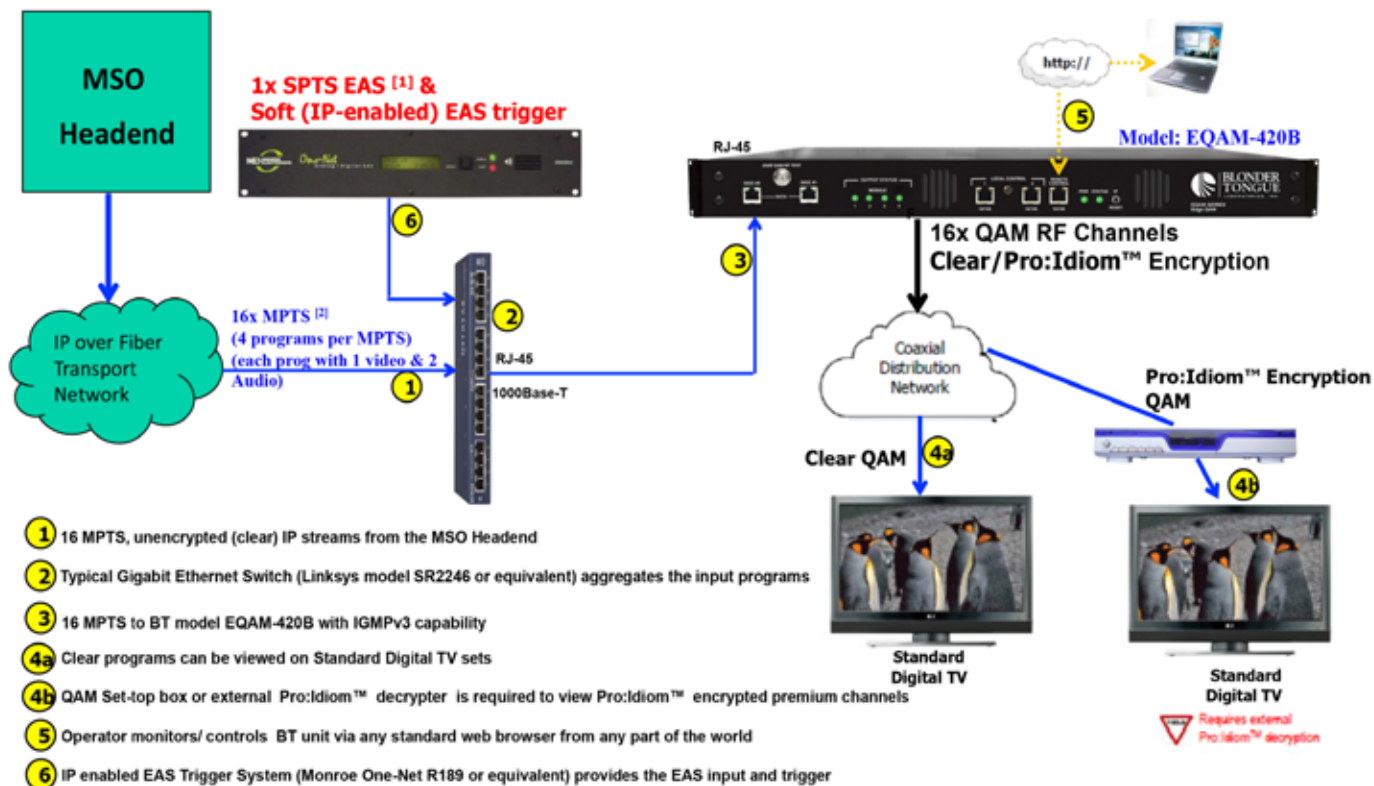


## Campus Video Emergency Management & Distribution Solution



### How it works

1. Messages are received and identified to ignore or transmit. Operators may create custom messages anytime
2. Message is queued and transmitted to television distribution system
3. Standard A/V programming is replaced by full screen text video and accompanying audio
4. At end of message (typically <2min) regular programming resumes
5. System can be set to repeat message at defined intervals during active alert window



- [1] Includes 1 video and 1 audio Elementary Stream; User-defined IP address; Overrides all existing programs with a full screen of the EAS message  
 [2] Each MPTS not to exceed 38.8 Mbps; each program with 1 video and up to 2 audio Elementary Streams



# Specifications

Model: **EQAM-420B**

## INPUT

<b>IP</b>	<b>Connector:</b> 2x RJ-45 <b>Standard:</b> 1000Base-T Ethernet <b>UDP/RTP:</b> Supported (user-selectable) <b>Protocols Supported:</b> IGMPv3; IGMPv2
<b>Stream Portfolio</b> <b>SPTS &amp; MPTS:</b> <b>Bitrate:</b>	Null Packet Deletion & Addition Mixing of input streams Variable and Constant
<b>EAS (Emergency Alert System)</b> <b>Connector:</b> <b>Standard:</b> <b>Trigger Mechanism:</b>	1x RJ-45 (trigger via 10/100 Remote Control port or Local Control #1 port) 10/100Base-T Ethernet Per SCTE-18 standard

## Requirements for Pro:Idiom™ Output

<b>SPTS</b>	<b>No. of programs:</b> 1 program (not to exceed 38.8 Mbps) <b>Null Packets:</b> Required (as per Pro:Idiom™ requirements) <b>Stream ID:</b> User- assigned (as per Pro:Idiom™ requirements) <b>Audio:</b> Dolby® Digital compliant
<b>MPTS</b>	<b>No. of programs:</b> Max. 6 programs per MPTS (not to exceed 38.8 Mbps) <b>Null Packets:</b> Required (as per Pro:Idiom™ requirements) <b>Stream ID:</b> User- assigned (as per Pro:Idiom™ requirements) <b>Audio:</b> Dolby® Digital compliant

## OUTPUT

<b>QAM</b>	<b>No. of Output Modules:</b> 4 Quad-QAM (total of 16 QAM channels) <b>Connector:</b> 1x "F" Female (rear-panel; for combined output) <b>Modulation:</b> QAM 16, 32, 64, 128, and 256 <b>Standards:</b> ITU-T J.83; Annex A and B <b>DVB Symbol Rate:</b> Variable; up to 7 MSymbol/sec (MBaud) <b>Frequency Range:</b> 54 to 1002 MHz <b>Tuning:</b> CATV Channel Selectable (CH. 2 to 158) <b>Channels' Bandwidth:</b> 24 MHz (4x Adjacent 6 MHz) <b>RF Level:</b> +40 dBmV, $\pm 1$ dB increment <b>RF Level Adjustment Range:</b> +35 to +42 dBmV, 1 dB increment <b>Frequency Tolerance:</b> $\pm 0.5$ kHz @ 77 °F (25 °C) <b>Frequency Stability:</b> $\pm 5$ kHz over 32 to 122 °F (0 to 50 °C) <b>Amplitude Flatness:</b> $\pm 0.25$ dB (over 6 MHz channel) <b>Phase Noise:</b> -98 dBc (@ 10 kHz) <b>Spurious:</b> -60 dBc <b>Broadband Noise:</b> -70 dBc (@ +40 dBmV output level, 5.5 MHz bandwidth) <b>Impedance:</b> 75 $\Omega$ <b>Spectral Inversion:</b> Auto Recognition <b>Carrier Suppression:</b> 45 dB <b>Return Loss:</b> 14 dB typical <b>Signal-to-Noise Ratio (SNR):</b> 40 dB typical <b>MER:</b> 39 dB typical <b>I/Q Phase Error:</b> Less than 1 degree <b>I/Q Amplitude Imbalance:</b> Less than 1%
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## General

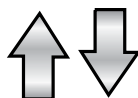
<b>Dimensions (W x D x H):</b>	19.0 x 18.125 x 1.75 inches (483 x 460 x 44 mm)
<b>Power:</b>	115-230VAC, 60/50Hz (Fuse:3.0A, 250VDC, Slo Blo)
<b>Power Dissipation:</b>	60 W
<b>Weight:</b>	12 lbs (5.4 kg)
<b>Operating Temperature:</b>	32 to 122 °F (0 to 50 °C)
<b>Storage Temperature:</b>	-13 to 158 °F (-25 to 70 °C)
<b>Operating Humidity:</b>	0 to 95% RH @ 35 °C max, non-condensing
<b>Storage Humidity:</b>	0 to 95% RH @ 35 °C max, non-condensing

## Alarms/Monitoring/Control

<b>Local Monitoring:</b>	4x Output Status Module LEDs 1x "F" Female RF Test Port 1x Power LED 1x Status LED
<b>Local Control:</b>	1x IP Reset button
<b>Remote Monitoring/Control:</b>	GUI-based menu via Web browser (1x RJ45 front-panel connector; 10/100Base-T)

Model: **IPAT**

**IP or ASI**



**ASI or IP**

## Features

### ASI Input/Output interface

- Supports Single or Multi Protocol Transport Services (SPTS or MPTS)
- Performs PCR (Program Clock Reference) correction
- Allows Null Packet insertion & deletion

### IP (GigE) Input/Output interface

- Provides robust protection against IP network jitter and delay
- Performs PCR (Program Clock Reference) replacement
- Supports Uni- and Multi-cast thru RTP/UDP protocols
- Supports IPv4, ARP, IGMPv2, and ICMP protocols
- Supports variable and constant bitrates

### Optional RF modules

- RF IN/OUT modules support both 8VSB and Annex A/B QAM modes
- RF IN module accepts 8VSB free-to-air & NTSC CATV standard channels 2-135
- RF OUT module provides NTSC CATV standard/sub-band channels 2-135/T7-T14
- RF OUT module provides output level of +40 dBmV



**Edge & IPTV**

## Ordering Information

Model	Stock #	Description
IPAT	6510	IP to ASI and ASI to IP Transcoder
IPAT-RFO	6512	IPAT equipped with RF OUT Module
IPAT-RFI	6514	IPAT equipped with RF IN Module

**MADE IN U.S.A.**

**12xASI**



**4xIP + 2xASI**  
(GigE)

## Features

- Accepts up to 12 unencrypted MPEG-2/H.264 Single or Multi-Program Transport Streams (SPTS or MPTS) in ASI format, each up to 270 Mbps
- Provides 1, 2, 3, or 4 MPTS output streams when operating in Single, Dual, Triple, or Quad IP Outputs Modes respectively
- Provides comprehensive GUI-based monitoring and control via standard Web Browsers
- Performs PCR (Program Clock Reference) correction, null packet insertion, and deletion
- Supports EAS (Emergency Alert System) input on ASI Input port 12
- Supports Uni- and Multi-cast thru RTP/UDP protocols
- Supports ARP, IGMPv2, and ICMP protocols
- Supports user-defined PSIP configuration



**Edge & IPTV**

## Ordering Information

Model	Stock #	Description
MUX-12A-IP	6517	12:4 ASI to IP Multiplexer; 12xASI inputs; 4xIP + 2xASI outputs; EAS Compliant

## Custom Remote Server

### IP Control & Monitoring



### Features

- Provides DHCP (Dynamic Host Configuration Protocol) services for communication
- Detects and controls satellite receivers on the headend network
- Ability to create a channel line-up for a headend and keeps satellite receivers tuned to correct channels
- Provides comprehensive GUI-based monitoring and control via standard Web browsers

### Benefits

- Easy to set up and configure through GUI
- Small, compact design requires small footprint in work area
- Ability to issue commands to receivers remotely for operator convenience

### Ordering Information

Model	Stock #	Description
Sentinel 200	184163	Custom Remote Server for DISH ViP211/k and ViP222/k satellite receivers; Provides remote monitoring & control of headend satellite receivers.



# Specifications

## Model: Sentinel 200

### INPUT/OUTPUT

Connectors	
<b>Receiver Control:</b>	1x RJ-45 10/100Base-T Ethernet
<b>Remote Control:</b>	1x RJ-45 10/100Base-T Ethernet

### General

<b>Dimensions (W x D x H):</b>	6.3 x 1.2 x 4.3 inches (160 x 30 x 108.5 mm)
<b>Power:</b>	110-240 VAC (+12 VDC, 0.5 A via external power supply to Server)
<b>Power Dissipation:</b>	6 W
<b>Weight:</b>	2 lbs (0.9 kg)
<b>Operating Temperature:</b>	32 to 122 °F (0 to 50 °C)
<b>Storage Temperature:</b>	-13 to 158 °F (-25 to 70 °C)
<b>Operating Humidity:</b>	0 to 95% RH @ 35 °C max, non-condensation
<b>Storage Humidity:</b>	0 to 95% RH @ 35 °C max, non-condensation

### Alarms/Monitoring/Control

<b>Indicators:</b>	2x LED (Status & Power)
<b>Local Monitoring/Control:</b>	1x IP Reset Button
<b>Remote Monitoring/Control:</b>	GUI-based menu via standard Web browser (1x RJ45 rear panel connector; 10/100Base-T)
<b>Alarms:</b>	Event Log via UDP to Remote Server

### Sample GUI-based Menus

**Sentinel-200**  
ESN: 2011070100  
Temperature: 95.2 F  
Uptime: 4d 23h 22m 30s  
Location: [blank]

Main | Status | System Config | Sat Receivers | [blank] | [blank] | [blank] | [blank]

VP222 Dish R0096521826 | Settings | System Info | Multi-Sub | Refresh

**Satellite Receiver Reset**  
Reset

**Tuner Status**

	Tuner 1	Tuner 2
Mode: Change	Clear Tuner	
Type	SAT	SAT
Status	Locked	Locked
Signal Strength	4E	89
AV Status		Started
Channel Name	TVARK	TVARK
Channel	101	

Save

**Satellite Receiver Status**

Front Panel	Unlocked
Remote IR LHF Control	Unlocked
Program Guide Update	Disabled
Inactivity Standby	Disabled

**Tuner Control**

Tuner 1	Standby	Wake
Tuner 2	Standby	Wake

**Sentinel-200**  
ESN: 2011070100  
Temperature: 95.2 F  
Uptime: 4d 23h 22m 30s  
Location: [blank]

Main | Status | System Config | Sat Receivers | Refresh

**Satellite Receiver Input - Config File Successful**

Receiver (Total: 12)	Tuner Status	Channel
1 R0096521826-32-T1	SS: 49 / Locked / Sat: 72	101 - TVARK
2 R0096521826-32-T2	SS: 76 / Locked / Sat: 119	101 - TVARK
3 R0096500753-58-T1	SS: 0 / Unlocked / Sat: 110	6301 - N/A
4 R0096500753-58-T2	SS: 0 / Unlocked / Sat: 115	8117 - N/A
5 R0096500753-111-T1	SS: 75 / Locked / Sat: 110	7 - N/A
6 R0096500753-111-T2	SS: 0 / Unlocked / Sat: 110	189 - DISC
7 R0096544392-12-T1	SS: 41 / Locked / Sat: 72	4182 - N/A
8 R0096544392-12-T2	SS: 43 / Locked / Sat: 119	4120 - N/A
9 R0096506514-34-T1	SS: 0 / Unlocked / Sat	8113 - N/A
10 R0096506514-34-T2	SS: 0 / Unlocked / Sat	8116 - N/A
11 R0096479173-80-T1	SS: 0 / Unlocked / Sat	4168 - N/A
12 R0096479173-80-T2	SS: 0 / Unlocked / Sat	8118 - N/A
13 No Sat. Receiver Assigned	-	-
14 No Sat. Receiver Assigned	-	-
15 No Sat. Receiver Assigned	-	-
16 No Sat. Receiver Assigned	-	-

**Satellite Receiver(s) in Database, But Not Currently Detected**

Receiver	Tuner 1 Channel	Tuner 2 Channel
1 R0096511332-48	-	4130
2 R0096462041-62	-	4130
3 R0096511033-46	9588	101

Edit

### Related Product

Model	Stock #	Description
HDE-8C-QAM	6370 1	MPEG-2 HD Encoder for Dish Network's ViP211k Satellite Receivers; 8 programs; 8xComponent + 8xComposite + 1xSpare inputs; 4xQAM + 4xASI outputs; EAS compatible



Dish Network Approved for Clear QAM HD Distribution

Model: AQT8-QAM/IP • AQT8-IP • AQT8-QAM

## Digital Off-Air Processing

8x8VSB/QAM

EAS  
(ASI or IP)



20 Programs Total with EAS



8xIP + 8xQAM  
Streams  
(1xGigE)

### Features

- Provides channel processing in a high density, low cost, versatile 1RU unit that reduces equipment, space, and the power needed for QAM or IPTV
- Accepts up to eight 8VSB or QAM channel inputs
- Provides a combination of eight SPTS or MPTS via one GigE RJ45 port (20 programs total)
- Maps QAM/8VSB input programs directly to QAM output channels
- Provides comprehensive GUI-based monitoring and control via standard Web browsers
- Supports Closed Captioning EIA-608 and EIA-708 when embedded in RF input(s)
- Accepts EAS input in ASI or IP formats (IP delivered services only)
- Provides in-service monitoring of selected input/output ports via RF Test connector and ASI output



Digital CATV

### Ordering Information

Model	Stock #	Description
AQT8-IP	6280	ATSC/QAM Transcoder; 8xATSCS/QAM inputs; IP outputs
AQT8-QAM/IP	6281	ATSC/QAM Transcoder; 8xATSC/QAM inputs; IP + QAM outputs
AQT8-QAM	6288	ATSC/QAM Transcoder; 8xATSC/QAM inputs; QAM outputs

MADE IN U.S.A.

# Operation

Model: AQT8-QAM/IP • AQT8-IP

## AQT8-QAM/IP



ASI Output

LED input indicators

AC power,  
Power  
Switch

EAS Contact  
Closures

EAS  
(ASI or IP)

8 QAM /  
8VSB Inputs



Management  
Ethernet  
10/100

8xIP  
Streams  
(1xGigE)

IP Address  
Rest

## AQT8-IP



ASI Output

LED input indicators

AC power,  
Power  
Switch

EAS Contact  
Closures

EAS  
(ASI or IP)

8 QAM /  
8VSB Inputs



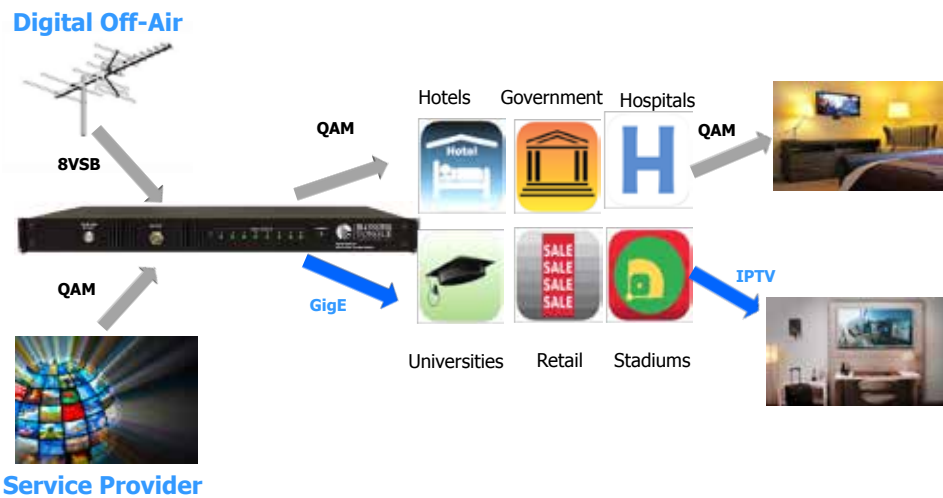
Management  
Ethernet  
10/100

8xIP  
Streams  
(1xGigE)

IP Address  
Rest

# Model: AQT8-QAM/IP • AQT8-IP • AQT8-QAM Solutions

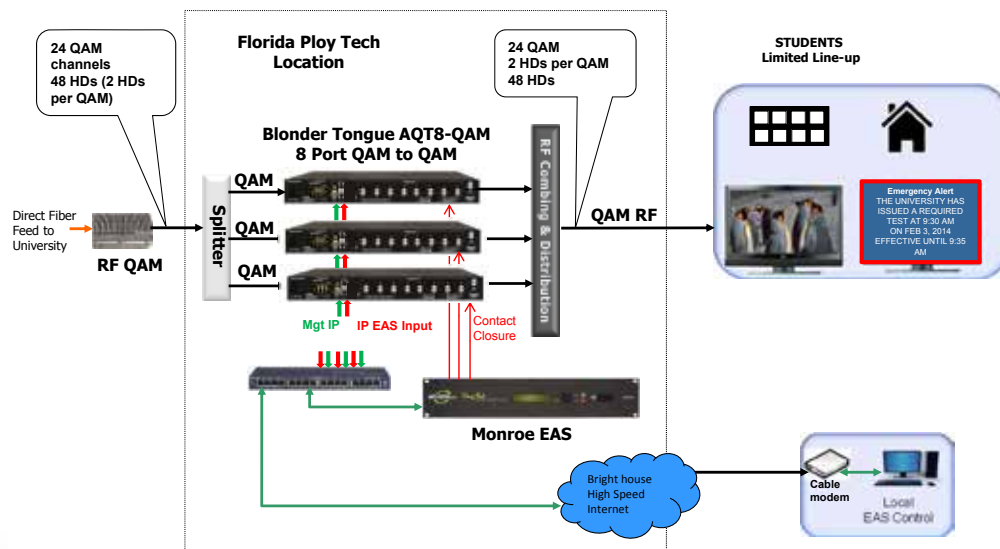
## AQT8-QAM/IP: Off-Air and QAM Video Content Delivery



## AQT8-IP: Off-Air and QAM Video Content Delivery



## AQT8-QAM: QAM Campus Application with Custom EAS Solution





# Specifications

Model: **AQT8-QAM/IP**

## INPUT

<b>Connectors</b>	<b>8VSB/QAM:</b> 8x "F" Female
<b>8VSB Mode</b>	<b>Standard:</b> ATSC Digital Television A/53E <b>Tuning Range:</b> UHF (Ch. 14-69), VHF (Ch. 2-13) <b>Data Rate:</b> 19.392 Mbps <b>Bandwidth:</b> 6 MHz <b>Power Level:</b> -20 to +20 dBmV <b>Impedance:</b> 75 Ω
<b>QAM Mode</b>	<b>Standard:</b> ITU-T J.83 - Annex A & B (64 and 256 QAM) <b>Tuning Range:</b> CATV Ch. 2-135 (STD, HRC, IRC) <b>Data Rate:</b> 38.8 Mbps (QAM 256); 26.97 Mbps (QAM 64) – Auto Detect <b>Bandwidth:</b> 6 MHz <b>Power Level:</b> -15 to 20 dBmV (@ QAM 256) -20 to 20 dBmV (@ QAM 64) <b>Impedance:</b> 75 Ω
<b>Emergency Alert System ASI</b>	<b>Connector:</b> 1x BNC Female <b>Standard:</b> DVB-ASI; EN 50083-9 (SPTS)
<b>IP</b>	<b>Connector:</b> 1x RJ45 <b>Standard:</b> 10/100Base-T <b>UDP/RTP:</b> Supported (user-selectable)
<b>Video Bit Rate:</b>	Single program video bit rate of 2.5 Mbps (typical). The EAS program bit rate must not exceed the lowest program video bit rate it will replace. For example, EAS at 2.5 Mbps will not work for a program at 2.0 Mbps.
<b>Trigger</b>	<b>Connectors:</b> Terminal Block <b>Trigger Mechanism:</b> 5-12 VDC & Dry Contact Closure

## OUTPUT

<b>IP</b>	<b>Connectors:</b> 1x RJ45 (Rear-panel) <b>Standard:</b> 1000Base-T Ethernet (GigE) <b>UDP/RTP:</b> Supported (user-selectable) <b>Address Assignment:</b> 8x IPv4 addresses & port numbers (user-selectable)
<b>QAM</b>	<b>No. of Output Modules:</b> 2 Quad-QAM <b>Connector:</b> 1x "F" Female (rear-panel; for combined outputs) <b>Modulation:</b> QAM 16, 32, 64, 128, and 256 <b>Standards:</b> ITU-T J.83; Annex A and B <b>DVB Symbol Rate:</b> Variable; up to 7 MSymbol/sec (MBAud) <b>Frequency Range:</b> 54 to 1002 MHz <b>Tuning:</b> CATV Channel Selectable (Ch. 2 to 158) <b>Channels' Bandwidth:</b> 2x 24 MHz (4x Adjacent 6 MHz) <b>No. of Programs:</b> Variable (not to exceed 38.8 Mbps, Pass-thru of input source) <b>RF Level:</b> +40 dBmV, ± 1 dB increment <b>RF Level Adjustment Range:</b> +35 to +42 dBmV, 1 dB increment <b>Frequency Tolerance:</b> ± 0.5 kHz @ 77 °F (25 °C) <b>Frequency Stability:</b> ± 5 kHz over 32 to 122 °F (0 to 50 °C) <b>Amplitude Flatness:</b> ± 0.25 dB (over 6 MHz channel) <b>Phase Noise:</b> -98 dBc (@ 10 kHz) <b>Spurious:</b> -60 dBc <b>Broadband Noise:</b> -70 dBc (@ +35 dBmV output level, 5.5 MHz bandwidth) <b>Impedance:</b> 75 Ω <b>QAM Spectrum:</b> Inverted <b>Carrier Suppression:</b> 45 dB <b>Return Loss:</b> 14 dB typical <b>Signal-to-Noise Ratio (SNR):</b> 40 dB typical <b>MER:</b> 39 dB typical <b>I/Q Phase Error:</b> Less than 1 degree <b>I/Q Amplitude Imbalance:</b> Less than 1%
<b>ASI</b>	<b>Connector:</b> 1x BNC Female <b>Standard:</b> DVB-ASI; EN 50083-9

## General

<b>Dimensions (W x D x H):</b>	19.0 x 16.0 x 1.75 inches (483 x 363 x 44 mm)
<b>Power:</b>	110 /230 VAC 60/50 Hz
<b>Power Dissipation:</b>	70 W
<b>Weight:</b>	12 lbs (5.5 kg)
<b>Operating Temperature:</b>	32 to 122 °F (0 to 50 °C)
<b>Storage Temperature:</b>	-13 to 158 °F (-25 to 70 °C)
<b>Operating Humidity:</b>	0 to 95% RH @ 35 °C max, non-condensation
<b>Storage Humidity:</b>	0 to 95% RH @ 35 °C max, non-condensation

## Alarms/Monitoring/Control

<b>Local Monitoring:</b>	8 Channel LEDs 1x Power LED
<b>Local Control:</b>	1x IP Reset Button
<b>Remote Monitoring/Control:</b>	GUI-based menu via standard Web browser (1x RJ45 rear panel connector; 10/100Base-T)

Stock #	Model	Input	QAM Output	IP Output
6280	AQT8-IP	8VSB or QAM	Not Applicable	Customizable IP Output <ul style="list-style-type: none"> <li>• 8 IP outputs with EAS</li> <li>• Program selectable from input</li> <li>• 20 programs max</li> </ul>
6281	AQT8-QAM/IP	8VSB or QAM	Pass-Thru QAM Output <ul style="list-style-type: none"> <li>• 8 QAM outputs</li> <li>• No program selection</li> <li>• One input maps to one output</li> </ul>	Customizable IP Output <ul style="list-style-type: none"> <li>• 8 IP outputs with EAS</li> <li>• Program selectable from input</li> <li>• 20 programs max</li> </ul>
6288	AQT8-QAM	8VSB or QAM	Pass-Thru Output <ul style="list-style-type: none"> <li>• 8 QAM outputs with EAS</li> <li>• No program selection</li> <li>• One input maps to one output</li> </ul>	Pass-Thru IP Output <ul style="list-style-type: none"> <li>• 8 IP outputs with EAS</li> <li>• No program selection</li> <li>• One input maps to one TS</li> </ul>

Model: **BTPRO-7000S**

## ***Know What's Happening in Your System...***



### **Features**

#### **Measurements:**

- MER, PER, LDPC, BCH, aBER, bBER, EVM, noise margin, level/power, real time spectrum analyzer and constellation display

#### **CATV Measurements:**

- Performs PCR (Program Clock Reference) correction
- DOCSIS downstream, INGRESS mode, LEAKAGE mode, BAR SCAN and TILT
- TV and CATV tuner, extended band, 4-1000 MHz
- Satellite tuner, extended band, 930-2250 MHz
- Auto discovery system automatically detects and selects analog and digital 8VSB/QAM TV signals in both Measurement and Spectrum modes
- Spectrum in real time, fast and super-fast with memory peak
- Detects, measures and displays video of MPEG 2/4 and H.264 HD programs
- All measurements, program lists, A/V PIDs, NET ID, virtual channel number, settings and pictures on one screen
- Automatic quality analysis: FAIL-MARG-PASS
- Auto memory, Manual memory and Datalogger functions
- Help function automatically identifies all the signals with digital modulation SAT, TV & CATV
- Bar scan TV and CATV function from 10 to 100 channels on one screen
- Audio decoding of AAC and AC3
- Battery test function, to regenerate and measure the batteries and calibrate the battery indicator
- Pre-memorized SAT transponder navigation
- Assisted satellite dish pointing
- DiSEqC commands



### **Ordering Information**

Model	Stock #	Description
BTPRO-7000S	4231 S	HD Tablet/Touch Signal Analyzer

# Displays/Specifications

Model: BTPRO-7000S

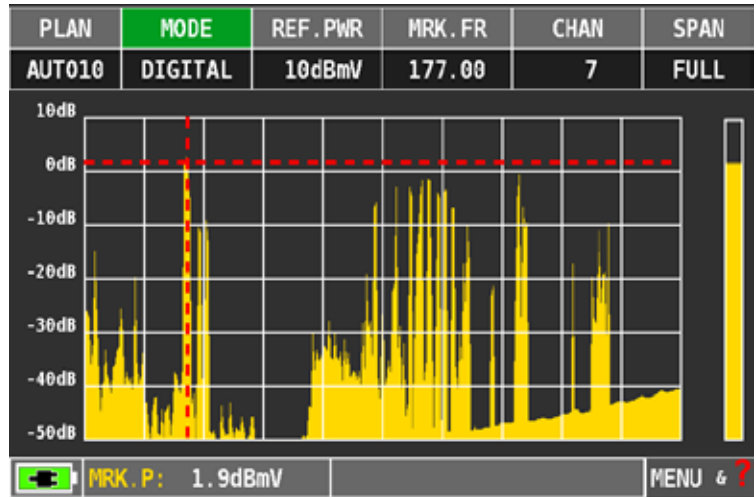
## Standard Measurement Display



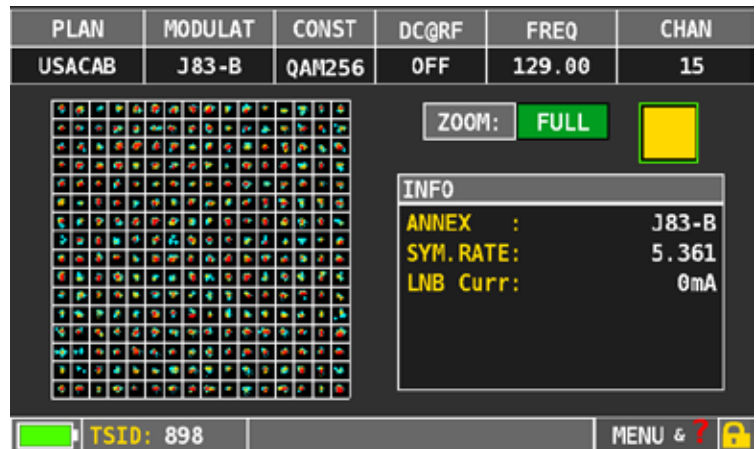
## Full Video Display



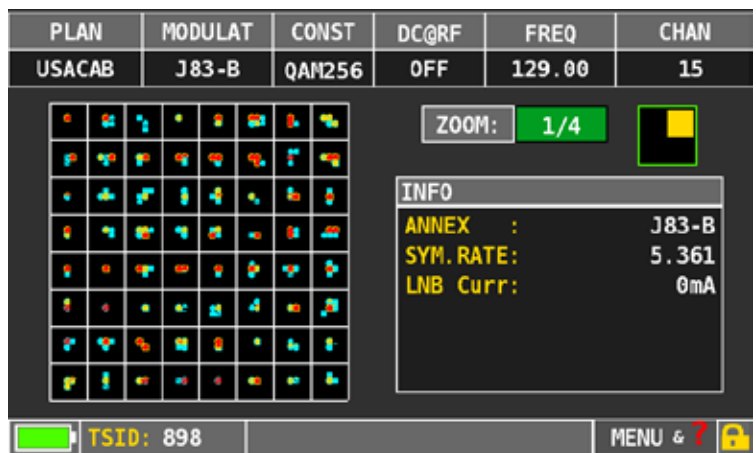
## Spectrum Display



## Constellation: Full



## Constellation: Zoom



## General

<b>Dimensions (W x D x H):</b>	9.5" x 1.6" x 5.5" (240mm x 40mm x 140mm)
<b>Weight:</b>	3.5 lbs. (1.6 kg)
<b>Display:</b>	7" TFT touch display, 16:9, high resolution
<b>Battery:</b>	LI-ION-POLIMER 4A battery with 4 hour battery capacity
<b>Supplies:</b>	Padded transport bag, AC and vehicle battery chargers



Model: **MTSA-PRO**

## *Know What's Happening in Your System...*



### Features

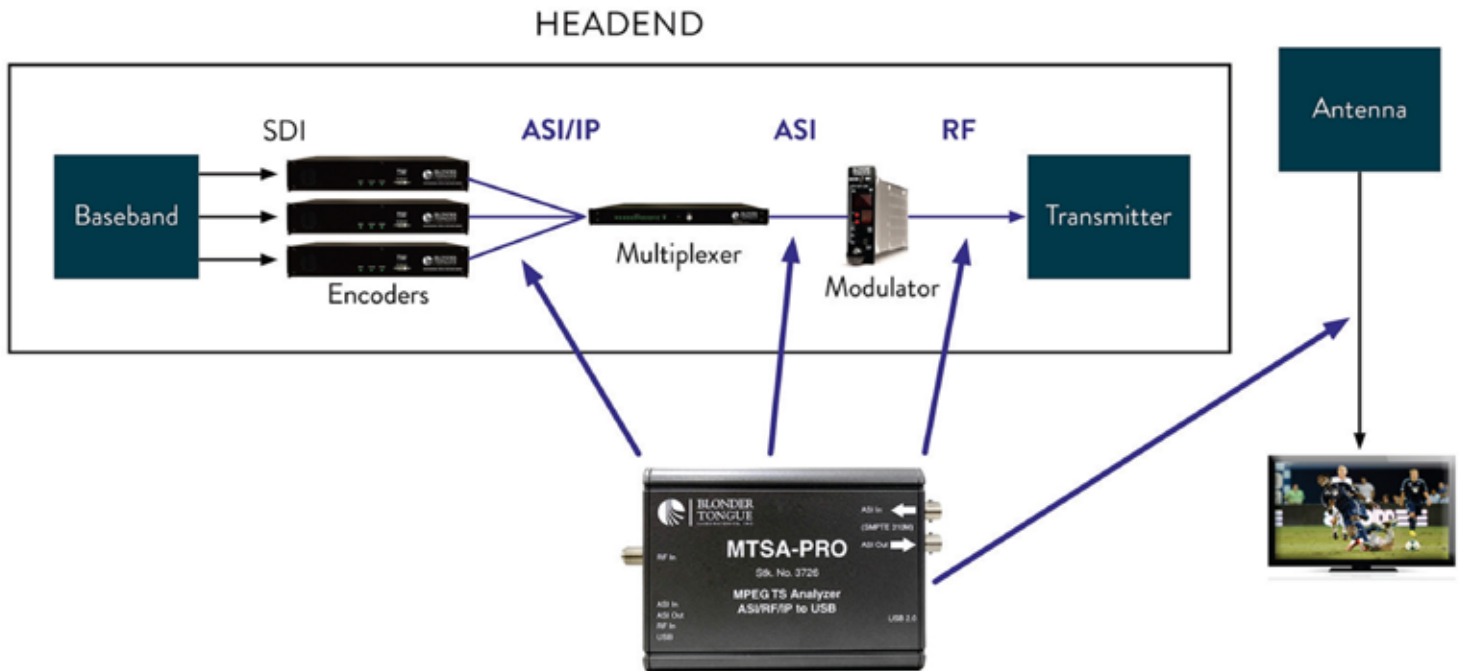
- Real time analysis via RF/ASI/IP input and TS file
- Single DVB-ASI input and single DVB-ASI output adapter for USB (half duplex)
- USB 2.0, bus powered, no power supply required
- ATSC, DVB-C, DVB-T and OpenCable DTV standards compliant
- MER and RSSI measurement and display for RF analysis
- MPEG TS analysis & capture and PES header analysis
- ETSI TR 101 290 Priority with real-time 4-stage error monitoring reporting and error logging
- Diagnostic and verification of MPEG designs (MPEG-2, H.264, HEVC)
- PCR & PTS analysis, arrive time graphing, measurement display and jitter analysis
- Triggered recording, Data rate analysis, Table and packet views
- SI/PSI & PSIP view and interval analysis
- SCTE-35 marker detection
- CAS view: ECM and EMM repetition rate and update time
- Real-time A/V decoding



### Ordering Information

Model	Stock #	Description
MTSA-PRO	3726	MPEG Transport Stream Analyzer; ASI/RF/IP to USB





## INPUT

<b>ASI/SMPTE-310M</b>	<b>Connectors:</b> 1x BNC; 75Ω <b>Standard:</b> DVB-ASI <b>Bitrate:</b> 0~108Mbps (in 1bps step) <b>Mode:</b> 188/204 bytes packet mode
<b>RF Demod</b>	<b>Connector:</b> 8VSB, QAM64B, QAM256B <b>Freq Range:</b> 1x 75Ω <b>Level Min:</b> 57-1000 G -15 dBmV QAM256B -20 dBmV QAM64B -30 dBmV 8VSB

## OUTPUT

<b>ASI/SMPTE-310M</b>	<b>Connectors:</b> 1x BNC; 75Ω <b>Standard:</b> DVB-ASI SMPTE-310M <b>Bitrate:</b> 0~108Mbps (in 1bps step) <b>Mode:</b> 188/204 bytes packet mode
-----------------------	---

## General

<b>Dimensions (W x D x H):</b>	6.06" x 3.89" x 1.12" (154mm x 100mm x 29mm)
<b>Weight:</b>	0.5 lbs. (227g)
<b>Power:</b>	USB 2.0 powered; no power supply required
<b>OS Supported:</b>	Windows 7

## Software

<b>TS Input:</b> <b>TS Out:</b> <b>Analysis Mode:</b> <b>7 analysis Window Tab:</b> <b>Closed Caption</b> <b>Real-time Decoder</b>	ASI, SMPTE-310M, File, IP (UDP/TS or UDP/RTP/TS), RF 0~108Mbps (in 1bps step) 188/204 bytes packet mode Service, PID, Table, Service View, Bit-rate, TR 101 290, Table History
---	--

**Recommended System Requirements:** CPU better than Intel Core i3; more than 2 GB RAM; Windows 7

Model: **BTPRO-1000**

## ***Know What's Happening in Your System...***



### **Features**

- QAM/8VSB/NTSC Measurements
- Extended frequency range of 4-1000 MHz
- MER, aBER, bBER, Noise Margin and Level/Power measurements plus Spectrum Analysis
- Automatic quality analysis: FAIL-MARGINAL-PASS
- Auto Seek & Store Function - an essential feature for creating custom memory channel plans. Scans receivable signals, determines signal type (QAM,8VSB or analog) and stores only those channels having signal levels above user defined values
- Ingress and Leakage Modes
- Data Logger Function: Steps through each channel in the "Active" memory plan and stores all related measurements
- Graphics Display
- Alpha-numeric keypad
- **Optional TV Key Recovery for Hospitality Pro:Idiom™ systems**



### **Ordering Information**

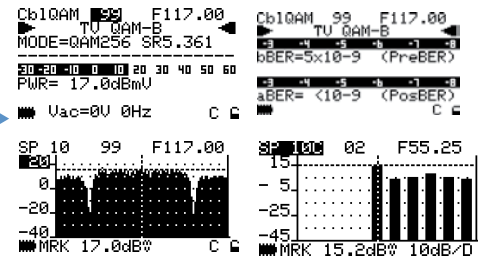
Model	Stock #	Description
BTPRO-1000	4230	QAM/8VSB/Analog Signal Analyzer
	4230 RK	BTPRO-1000 with Pro:Idiom™ Key Recovery

# Operation/Specifications

Model: **BTPRO-1000**

## BTPRO-1000

4-1000 MHz (-45 to +65 dBmV)  
CATV / Broadcast Channel Plans  
QAM/8VSB/Analog



USB



PC with  
BTPRO "SMART"  
connection software for  
Data logger downloads

## Pro:Idiom™ Key Recovery (RK Option)

PROIDIOM MENU  
PLAN : Cable  
CHANNEL : 2  
MODE : QAM64  
COMMAND : Restore  
SET PARAMETERS?  
SEND COMMAND  
STATUS : Ready



CATV Channels 2 to 158  
Broadcast Channels 2 to 69  
QAM 64B or 256B



## Level Measurement & Spectrum Analysis

<b>Frequency Range:</b>	TV, CATV & Radio 4-1000 Mhz
<b>Frequency Resolution:</b>	25 kHz
<b>RF Input Impedance:</b>	75 $\Omega$ (interchangeable "F" connector)
<b>Dynamic Range:</b>	-59 to +65 dBmV
<b>Measurement Resolution:</b>	0.1 dB
<b>Level Measurement Accuracy:</b>	1 dB typ. (2 dB max)
<b>A/V Ratio:</b>	up to 22 dB, +/-1.5 dB (2 dB max)
<b>C/N Ratio:</b>	up to 45 dB +/-1.5 dB Max; 45-50 dB +/- 2 dB
<b>Resolution Filter Bandwidth:</b>	100 kHz @ -3 dB
<b>Custom Channel Plans:</b>	25 (199 ch. per plan)

## General

<b>Power Supply:</b>	Built in NiMh rechargeable battery, external power supply
<b>Battery Duration at 25°:</b>	4 hours
<b>Size:</b>	8.5" x 5.0" x 2.4" (215 x 125 x 60 mm)
<b>PC Interface:</b>	USB
<b>Front Panel:</b>	Alpha numeric keypad
<b>Power Save:</b>	TFT backlight timer, brightness adj

## Power & Digital Measurements

<b>Frequency Band:</b>	4-1000 Mhz
<b>Power Measurement:</b>	-45 to 65 dBmV
<b>BER Measurement:</b>	(pre) bBER up to 1 x 10-9 (post) aBER up to 1 x 10-9
<b>MER Measurement:</b>	up to 40 dB (1dB typ., 2dB max)
<b>Constellation Display:</b>	16-32-64-128-256 QAM

## Leakage Measurements

<b>Frequency Range:</b>	115 -140 Mhz
<b>Resolution:</b>	25 kHz
<b>Antenna Type:</b>	selectable

## Ingress & Spectrum Measurements

<b>Frequency:</b>	5 - 65 Mhz
<b>Level:</b>	-55 dBmV to 65 dBmV
<b>Accuracy:</b>	+/- 2 dB
<b>BW:</b>	100 kHz @ -3dB

## Pro:Idiom™ Key Recovery Option

<b>RF Output</b>	
<b>Connector:</b>	1x "F" Female
<b>Modulation:</b>	QAM 64 or 256 (user selectable)
<b>Standard:</b>	ITU-T J.83 Annex B
<b>Channel Range:</b>	CATV 2 to 158, Broadcast 2 to 69
<b>Output Level:</b>	20 dBmV

## Demodulators

Model: **AQD**  
Stock #: **6245**



**1x8VSB/QAM**



**1xAV/2xASI**

Model: **MDDM-860**  
Stock #: **6273**



**8VSB/QAM**



**Analog (NTSC)**

## Modulators

Model: **AQM**  
Stock #: **6271B**



**1xASI**



**1xQAM**

## Splitter

Model: **ASI-4**  
Stock #: **6507**



**1xASI**



**4xASI**

## Processors

Model: **AP-60-860A**  
Stock #: **59819**



**1xRF/QAM/8VSB**



**1xRF/QAM**



## Processors

Model: **DAP PLUS**  
Stock #: **59819**



**1xRF/QAM/8VSB**



**1xRF/QAM**

Model: **DHDP**  
Stock #: **6266B**



**1x8VSB**



**1xIF**

**1x8VSB**

## Transcoders

Model: **AQT Series**  
Stock #: **6275**



**8VSB/QAM**



**QAM**

Model: **MDDA-860**  
Stock #: **6277**



**8VSB/QAM**



**ASI**

## Transcoder Module

Model: **QTM-HD PLUS**  
Stock #: **6242**



**QPSK/8PSK**



**QAM**

*New BT offering...*

# EXTENDED WARRANTY

***Add Peace of Mind to Your Investment!***

*Up to 90 days after order shipment, you have the option to purchase a 1 or 2 years extended warranty. Period begins after expiration of our standard product warranty.*



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Tongue

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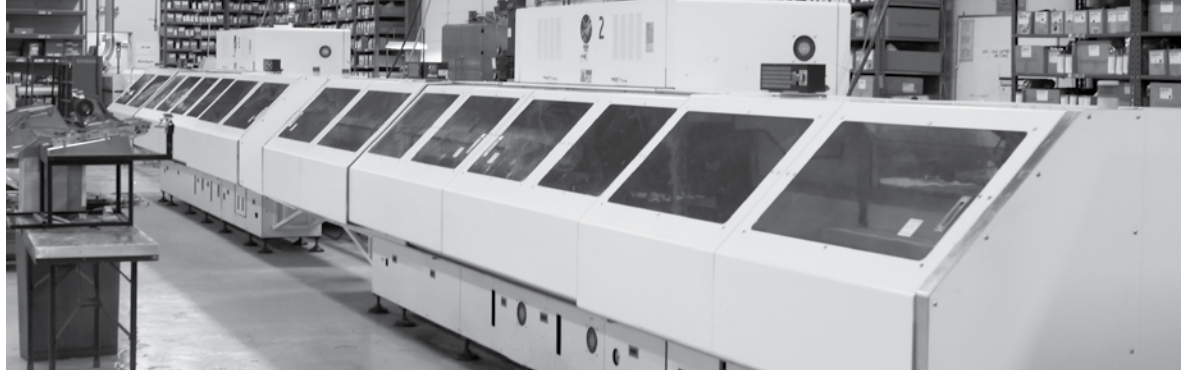
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